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THE NEW INTERNAL REVENUE ACT AND THE PROSPERITY OF THE ECONOMY*

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PRESIDENT EISENHOWER'S *Economic Report* transmitted to the Congress in January, 1954, contained a chapter on "Reforming the Tax Structure."[1] This included a section entitled "Encouragement of Enterprise and Employment." Six proposals were set forth. Five of them, with modification, became a part of the 1954 Internal Revenue Code. The major purpose of this paper is to examine these five features to determine what they offer as devices to stimulate enterprise, employment, and prosperity.

The five features are:

First: The extension to two years (instead of one) of the carry-back for net business losses.

Second: The modifications in the taxation of dividend income received by individuals.

Third: The provisions for accelerated depreciation.

Fourth: Provisions for deduction of research and development expenditures.

Fifth: The relaxation of provisions relating to the taxation of undistributed earnings of corporations.

(A sixth recommendation proposing certain changes in the taxation of income from foreign investments was not enacted.)

EXTENSION OF THE NET OPERATING LOSS CARRY-BACK

The extension of the net operating loss carry-back from one to two years is the first change to be considered. It is intended (as are the others) to operate as an incentive to business expansion. This particular feature offers potential tax savings to mitigate the financial consequences of an unprofitable venture or undertaking. The advantage of a two-year, rather than a one-year, carry-back is that an individual or corporation, having just completed an unprofitable year and facing an uncertain future, might be loath to undertake some new and risky venture if there were no way in which some tax benefit could be salvaged in the event of failure. If, however, an earlier profitable year was within the backward reach of this provision of the law, the incentive aspect would be maintained. The 1954 Act extends this backward reach one year. There is some indication that this change may be expected particularly to benefit small businesses.

Apart from the possible incentive value of this change, it continues and slightly

* This paper was presented at the annual meeting of The American Accounting Association, Philadelphia, September 1, 1955.

[1] *Economic Report of the President Transmitted to the Congress January 28, 1954* (Washington: U. S. Government Printing Office, 1954), pp. 77–82.

strengthens the virtue of the predecessor provision as a taxable-income-averaging device. I suspect that we accountants are predisposed in favor of such provisions. We have reason to know that estimation and uncertainty usually surround the calculation of business income on an annual basis.

It is not easy to judge the extent of possible beneficial effects on the economy of this provision or, for that matter, of any of these changes. Early in the study and meditation preceding the preparation of this paper, I recognized the futility of attempting any statistical analysis of the effects of any and all provisions of the new law upon the prosperity of the economy. Too many interacting economic, social, and political factors are involved to make it possible to isolate the effect of any one, or of all of them together.

If it were necessary—and I am sure it is not—impressive evidence could be presented to prove the contention that the year that has followed the enactment of the 1954 Internal Revenue Code has been a prosperous one. I have at hand a recent issue of the government publication called *Economic Indicators*.[2] (Doubtless it is familiar to many of you.) Numerous pages of charts and tables of economic activity collectively sustain the assertion that the nation is enjoying prosperity.

It would clearly be folly, however, to attempt to say how much of our economic well being has been due to the new tax law, much less any particular part of it. However, it is interesting to speculate on the possible force that these statutory changes can exert, both under present conditions and under conditions of recession, or even depression.

It seems reasonable to conclude that under prosperous conditions and with relatively high tax rates, the extension of the net-operating-loss carry-back from one to two years may indeed offer some incentive to business venturesomeness. Under these conditions it might add a few ounces of thrust toward business expansion. It might even be helpful in counteracting slight recessionary forces. It may serve to reduce the number of business failures, and, accordingly, tend to retard the cumulative process of contraction.

However, if business profits and, hence, taxes on them are low and declining, or if, heaven forbid, we should get into a depression on the order of that in the early and middle thirties, it is hard to believe that this feature of the law could do much, if anything, to promote an upturn.

THE DIVIDEND-CREDIT PROVISIONS

The second feature of the new law to be considered—the dividend-credit provisions—has interesting and controversial aspects. This change in the system is offered as a step in the direction of removing that much-hissed villain, double taxation of corporate earnings. However, there appears to be a feeling on the part of many, perhaps most, economists that this villain is only a ghost or, at least, is not as bad as widely supposed. The central issue is whether the burden of corporate income taxes can be shifted. This has been a subject of extensive investigation by economists. Apparently, the last word on the subject has yet to be said. A variety of factors enter into consideration such as the nature of the business and the type of demand it faces, the economic conditions prevailing at a given time, and various others. A very generalized conclusion is that, in many cases, at least a part of the burden of corporate income taxes can be shifted.

To the extent that corporate income taxes cannot be shifted, double taxation is present. This is a matter of equity. Pre-

[2] Prepared for the Joint Committee on the Economic Report by the Council of Economic Advisers. Published monthly by the U. S. Government Printing Office, Washington.

sumably, prosperity and the common good could not long be promoted by a tax that was, essentially, unfair. Two questions arise: (1) How severe was the inequity of double taxation? and (2) Does the new dividend-credit provision at least partially remove an element of real or imagined inequity in the previous law?

Some light on both of these questions has been shed by Daniel M. Holland of the National Bureau of Economic Research, in a report presented at the meeting of the American Economic Association last December, concerning some of the findings of his organization.[3] Starting with the assumption that the corporate income tax *cannot* be shifted, the analysis contrasts the tax burden on corporate earnings to stockholders in various income-classes when both the corporation is taxed on earnings and the stockholders on dividends, with the burden that would result if each stockholder were taxed on his distributive share of the corporate income (the partnership method). The conclusion was that stockholders in the lower income levels were heavily overtaxed, the degree of double taxation diminishing as the stockholder-income level increased.

This analysis went on to examine the effect of the new dividend-credit provisions. Evidence was offered to show that the new provisions afford the greatest degree of relief from double taxation where it is needed most: at the lower end of the income scale. However, from about the $15,000 level on up, the less the relief is needed, the more it is given.

If this analysis is correct, the new dividend-credit provisions only partially remove the inequity of double taxation. It might be argued, however, that those with the most to invest are securing an incentive that, even if not entirely justified on the grounds of equity, could be condoned as conducive to prosperity by stimulating the flow of risk capital.

Still another aspect of the problem is the effect of income taxes on incentives. Professor J. Keith Butters of Harvard reporting on the results of some studies in which he participated, indicates that taxes, by themselves, have not been a substantial deterrent to incentives to invest. It was found that taxes have been a greater restriction on capacity to invest than on incentive, and that taxes have more effect on how a thing is done than if it is to be done.[4]

Three conclusions as to the possible contribution of the dividend-credit feature to the prosperity of the economy are offered:

(1) An attribute of the tax system widely considered to have been inequitable has been partially removed. The precise extent to which the inequity existed and the extent to which it has been removed are not certain.

(2) The relative attractiveness of corporation stock to investors has been improved. This is likely to make equity financing easier. This, in turn, may be expected to increase ratios of owned to borrowed capital. Whenever such a shift occurs, the business involved becomes better able to withstand economic reverses. Business failures may be fewer.

(3) It is hard to believe, however, that this provision of the 1954 Act could be a major factor in preventing a depression, or in starting a recovery at a time when corporate earnings were small, dividends meager, and the outlook cloudy.

ACCELERATED-DEPRECIATION PROVISIONS

The third of the quintette of changes being considered, the section of the 1954

[3] Daniel M. Holland, "The Differential Tax Burden on Stockholders," *American Economic Review*, May, 1955, p. 415.

[4] J. Keith Butters, "Taxation, Incentives, and Financial Capacity," *American Economic Review*, May, 1954, p. 504.

Act relating to depreciation, is another many-sided issue. This feature, like the other changes, is offered as an incentive—in this case an incentive to stimulate investment in new depreciable assets. Presumably, the opportunity to write off a large share of the cost of such property for tax purposes in a relatively short time reduces the risk of making such investments. The prospect of "getting your money back" before paying taxes is calculated to be an attractive one to managements and the equity investors they represent. These provisions are a move in this direction.

Several aspects must be weighed in judging whether this change in the law will accomplish its purpose, as well as whether the purpose is sound. If one starts with the premise that business-income measurement is an accounting matter, and that taxable income should be determined in accordance with the best accounting standards and principles, the question arises as to whether reducing-charge, in contrast to straight-line, depreciation is generally sound accounting. In this case that would mean: Is reducing-charge depreciation, in general, a proper way to allocate the cost of long-lived assets to the periods benefited? Certainly much can be said in favor of reducing-charge methods. As a means of counterbalancing increasing maintenance cost, and as a way of recognizing the possible or probable greater contribution of a new asset to the income-producing process, these methods are entitled to consideration, They seem to give deservedly-greater emphasis to the obsolescence factor.

Whether reducing-charge depreciation will ever become as "accepted" as the straight-line method is a matter of opinion. I would judge that it may, though this is not to say that straight-line depreciation will be universally, or even widely, abandoned.

If reducing-charge depreciation is acceptable on accounting grounds, then this change in the statutes narrows the breach between so-called "good accounting" and the rules for computing taxable income.

From another viewpoint, the accounting soundness of the change is a minor consideration. There are good reasons to maintain that the rules relating to the calculation of taxable income need not, should not, and/or cannot parallel the practices generally regarded as good income accounting. If this approach is adopted, then the depreciation features of the new act should be judged on the basis of their promise of success in accomplishing their avowed purpose of stimulating investment in depreciable assets.

As incentive devices, several virtues are claimed for these provisions of the 1954 Act. It is contended that a business adopting one of the allowed reducing-charge methods will gain certainly one, and possibly two, financial benefits. If the tax rates do not change over the years (an unlikely assumption), the use of reducing-charge depreciation with respect to a particular asset will reduce the income tax that must be paid in the early years of ownership and increase it in later years. Even though the total amount of tax paid would be the same, the deferment of part of the payment amounts to an interest-free loan from the government.

There are some who maintain that a continually-expanding enterprise using accelerated depreciation gets more than just a tax deferment—that it will enjoy what amounts to a continuing effective tax-rate reduction.[5]

The suggestion has been advanced that this feature of the law will have a consider-

[5] See: Evsey D. Domar, "The Case for Accelerated Depreciation," *The Quarterly Journal of Economics*, November, 1953, p. 493; Robert Eisner, "Depreciation Under the New Tax Law," *Harvard Business Review*, Vol. 33 (January–February, 1955), p. 66; Richard Goode, "Accelerated Depreciation Allowance as a Stimulus to Investment," *The Quarterly Journal of Economics*, May, 1955, p. 191.

able incentive effect on business people who consider the length of the so-called "pay-off period" in making investment decisions. Taking advantage of this provision can shorten this period, reduce risk accordingly, and thus act as an incentive to investment.[6]

It is also contended that the reluctance of business men to retire facilities is less when the units have a low book value. The discard of nearly- or completely-depreciated assets results in a small or no book loss. If reducing-charge depreciation is used, the book value of the properties is reduced faster and, it is claimed, reluctance to replace them is accordingly diminished.

Business men who think in those terms are obviously not the product of our university schools, colleges, and departments of business administration. Our enlightened graduates know that past costs are not to be considered in making investment decisions. However, the fact that an idea is unsound may not reduce its influence. If misunderstanding is retarding asset replacement, perhaps an indirect remedy is to use reducing-charge depreciation. To be effective, an incentive must appeal to what a person does think, not to what he should think.

The desire to increase investment in capital goods rests upon the proposition that this is the best, or at least a very good place to stimulate the economy. I find that this conviction appears to be an article of faith among most denominations of economists. Gross national product can be enlarged by expanding consumption, government spending, or investment. An important type of investment is adding to the stock of plant and equipment. If a high level of economic activity is already present, a dollar spent in increasing productive facilities apparently can have greater direct and repercussive influence as an expansionary force than a dollar used in almost any other way. This dollar adds to the supply of producers goods, but finds its way into the hands of people who want to buy consumers goods. There is, then, an added demand for the latter not immediately matched by an increase in their supply. I believe that, in the jargon of economists, this is called the "multiplier" effect.

The economic stimulation expected to result from these several features of the new Act is essential from a government-revenue standpoint apart from the social benefits intended. In the case of all of these features, the corporate or individual taxpayer is offered a possible means of tax reduction—either temporary or a net reduction in the effective rate paid. Assuming that the government has to have a certain amount of revenue, anything lost by the operation of these new features must be made up in some other way. Making it up by a general increase in the tax rates to offset these selective savings might leave many taxpayers substantially where they were before. Others would suffer by a shift in the burden. Even if a reallocation of the total tax load made for greater equity and provided the same amount of revenue as before, the major purpose of the changes would not be realized. It is intended that the provisions will afford sufficient stimulus to cause more production, more sales, and more profits so that the same, or even lower, tax rates will provide as much revenue as before, and possibly more. These changes are really intended to cause individuals and corporations to pay more taxes, not less, while leaving these taxpayers better off—both absolutely and relatively—after taxes.

It should be noted in passing that this accelerated-depreciation feature will not have a uniform impact. Its potential bene-

[6] Goode (*op. cit.*) treats this feature in some detail and points out that the longer loss-carry-back provision of the new law is similar to the accelerated-depreciation provision in reducing the disincentive effects of a long depreciation period.

fits are greatest to the businesses whose relative stock of fixed assets is the largest. Furthermore there is reason to contend that this provision is relatively more important for low-yield than for high-yield investments.

So far, there is little evidence that this provision of the new law is engendering any enormous expansion of capital equipment. Available statistics and estimates indicate some increase in the rate of expenditures for plant and equipment, but not large enough to be startling. For several years the McGraw-Hill Publishing Company has been conducting annual surveys of the plant and equipment expenditure plans of American businesses. A comparison of the last few reports does not suggest that the new depreciation provisions are proving to be a tremendous stimulus.[7] A recent survey conducted by the National Industrial Conference Board revealed that 45 per cent of the manufacturing companies surveyed are changing their depreciation policies to take advantage of the new provision. About two thirds of the 75 companies that are making the change indicated that the shift in method will have no influence on their capital spending plans. Non-tax, long-run considerations appear to be more dominant factors in their decisions.[8]

It is in order to wonder whether business men are yet convinced that the benefits of this provision are as great as is claimed.

While it is difficult to deny that this feature of the law will probably have some, maybe considerable, force in stimulating plant and equipment expenditures when profits and taxes are both high and when there are future prospects for both high profits and high taxes, it is hard to believe that this feature would have much influence under depressed conditions. It might make things worse. During a depression it might be advisable to postpone investments until the resulting larger depreciation allowances could be used to offset expected future profits. In a recent article, Professor Domar of Johns Hopkins made that point, and adds the thought that " . . . heavy amortization of investments during the boom will leave little depreciation to charge during the slump, and thus understate taxable profits in the first instance and overstate them in the second, with parallel and highly undesirable movements of tax liabilities."[9]

RESEARCH AND DEVELOPMENT EXPENDITURES

The fourth feature of the new Act to be considered is the section relating to research and development expenditures. The new provisions give the taxpayer the choice as to whether to expense or capitalize (and subsequently amortize) outlays for research and development. Once the method is chosen, however, there can be no change without permission. It is expected that this provision may be of particular benefit to small businesses.

Research and development activities have an economic consequence of greater importance than might be supposed. Speaking to this point in a recent address, Dr. Niel H. Jacoby, said:

" . . . As research produces new scientific discoveries, and as science is applied to industry, new products are created, existing products are improved, and more efficient processes of production are developed requiring new equipment. Scientific research and development is, therefore, a great destroyer of the value of existing capital equipment, constantly eroding away apparent 'excess capacity.'

[7] Department of Economics, McGraw-Hill Publishing Company, "Business' Plans for New Plants and Equipment, 1953–56," "—1954–57," "—1955–58."

[8] "Depreciation Policies Under the 1954 Code." *The Conference Board Business Record*, February, 1955, p. 70.

[9] Domar, *op. cit.*, p. 510.

By the same token, it is a great creator of demand for new capital goods. Not only does it tend to enlarge plant and equipment expenditures; it tends to stabilize them through time. Suppose one firm in an industry cuts its costs by re-equipping and making use of a new process. It then is able to cut its prices and take sales away from its competitors. The other firms in that industry will now have to make large capital outlays, in order to take advantage of the new process and to protect their positions in the market. For example, if petroleum company *A* produces high octane gasoline from a new refinery to meet the demands of motorists, then petroleum companies *B*, *C*, and *D* are likely to spend hundreds of millions of dollars on new refining equipment simply as a defensive measure to meet this threat to their market positions. Technological change makes much capital spending by business compulsory, and not optional, in a very real sense. This process continues through good times and bad.[10]

The change in the law relating to deductions for research and development expenditures and the accelerated-depreciation provisions are not unrelated. Both are intended to promote expansion and improvement or replacement of capital equipment. If the result of expenditures for research and development is, as intended, the discovery of new products and new productive processes, this will make obsolete old equipment and facilities. Their replacement, presumably more readily undertaken because of the stimulus of accelerated-depreciation deductions, would bring about the desirable consequences that attend this type of expansion.

Once again, however, the question must be asked: How much incentive value will this change have in counteracting a recession or stimulating a recovery? And once again, it is hard to conclude that the change can add more than another few ounces of forward thrust. The change may help maintain or slightly increase flying speed that was already adequate—it might help to delay a stall. But if important recessionary forces take command, the counteracting impetus of this feature is likely to be negligible. Like the change previously considered, this one might serve to retard the recovery.

[10] Neil H. Jacoby, "The Effect of Economic Policies on Plant and Equipment Expenditures," *Proceedings of the Seventh Annual Industrial Engineering Institute, University of California*, 1955, p. 57.

TAXATION OF UNDISTRIBUTED EARNINGS

The fifth, and last, of the specific provisions of the new Internal Revenue Act to be considered is the change in taxation of retained or accumulated earnings. This is a modification of the famous—or infamous—old Section 102. The new law makes two changes: (1) a $60,000 accumulated earnings credit is provided, and (2) the burden of proof as to the "unreasonableness" of the accumulation is shifted from the taxpayer to the government. The first change is particularly intended to benefit small corporations and their stockholders.

The expansionary-incentive aspect of this change of the law appears to rest upon the expectation that monies not distributed as dividends will be invested in plant and equipment with the consequent succession of desirable results. This feature, then, is a stable-mate of the accelerated-depreciation and research and development provisions.

This change appears to point up an interesting contrast in philosophies as to how economic activity and prosperity should be promoted. The original surtax on unreasonable accumulation of earnings was imposed primarily as a device to increase revenue either from the added tax itself or, more importantly, from taxes on more dividends that corporations would

pay to avoid the penalty tax. There was supposed to be a stimulating effect in all of this, however. Stockholder-consumers would have more money to spend and their spending would expand economic activity. The new law also aims to stimulate—but by the means of increasing expenditures for plant and equipment both through encouraging corporations to use earnings for this purpose and by making equity financing more attractive by the dividend-credit device. Whether these two approaches are basically different, or whether the difference grows out of the differing economic atmospheres prevailing at the time each of them was introduced, is a question for the economic theorists to answer.

Just exactly what the new provision will really amount to is hard to foretell. How vigorously will the government undertake to prove "unreasonable" accumulations? If cases get into the courts (as they probably will) what will be the judicial interpretation of this new feature? Time will have to provide those answers.

As a promoter of prosperity, this feature of the new Act is brother to the accelerated-depreciation and research and development provisions; all three offer incentives to expand plant and equipment expenditures. If that is the "way to do it" this change in the law is a proper one and consistent with the others whose aim is similar. The dark side of the picture is the realization that opportunity to accumulate earnings is a dubious incentive if there are no earnings.

SUMMARY AND CONCLUSIONS

As a summary evaluation of these five features of the new Revenue Act as devices to maintain and encourage national prosperity, four observations are offered:

(1) If these features are to operate effectively, prosperous conditions must already exist. Business profits must be high, and taxes relatively high. All that is offered in any case is the chance to reduce or postpone taxes by taking certain courses of action. The less the tax to be paid anyway, the less the incentive.

(2) For these features to have their greatest impact, there must be widespread confidence in the future, and the prospect for a general reduction in taxes must be present—at least, no expectation of tax increases. If a possible tax deduction appears to have more probable value in the future than in the current year, there would be an incentive to postpone expenditures.

(3) The effectiveness of these features under the conditions described rests upon the assumption that a high and expanding rate of plant and equipment expenditures is a major, or *the* major, way to assure continued prosperity. If this is not true, then these features are improperly aimed.

(4) As devices to aid in ending a serious recession or depression, these features offer very little. It has been seen that some of them might even tend to work the other way. In this view, all five features appear to be "fair-weather friends": they do offer help when there is some need for it, but when the need becomes really great, they can do little or nothing—and maybe do harm.

However, in passing judgement on these five features, their potential force as sustainers of existing prosperity should not be minimized. These changes in the law were timely. Our current concern is keeping our economy moving at the present considerable speed with controlled and steady acceleration. These features offer some promise of helping. It would be a mistake to regard them as anything more than "helpers." They are only a part of an intricate tax system. The system itself is not an all-purpose economic tool; it is only one of several regulators in the economy.

There is little doubt that many of the various other new features of the 1954 Revenue Act can have, collectively, a positive impact. Some of the provisions strengthen the system by reducing opportunities for tax avoidance. Some are intended to reduce inequities. Some are designed to facilitate administration. As each of these succeeds in its specific purpose, the system is improved and the economy benefited.

The psychological overtones of the 1954 Internal Revenue Code should not be overlooked. Impressive fanfare attended its passage. It was widely heralded as a law designed to promote the free-enterprise system. Even if the purported virtues are not as substantial as claimed, it is difficult to doubt that the adoption of the Act has had beneficial psychological influence upon a considerable segment of the population. Publicity and high-powered advertising appear to have powers greater than merely earning for a product the acceptance deserved on the basis of merit alone.

In concluding, it is in order to suggest that perhaps this new Code should be looked upon as the first step, or the first few steps, toward a tax system that gives more attention to economic incentives. In previous revisions of our tax system, the factor of urgent and immediate revenue needs seems always to have overshadowed all other considerations. This time that shadow was not quite as long.

A PRACTITIONER'S PLEA FOR MORE TRAINING IN WRITTEN ENGLISH

ROSECRANS BALDWIN
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AT THE recent American Accounting Association convention in Philadelphia, I attended the round table discussion on the question of the proportion of a student's four collegiate years that should be devoted to liberal arts subjects as opposed to accounting and other business subjects. As I shall explain in a moment, this whole subject is rather close to my heart. Accordingly, I went to the session eagerly, hoping to hear something reassuring on a matter which is, I think, one of the most serious problems that our profession is facing today, and on which little but gloom has emanated from the campuses. I refer, of course, to the matter of general student literacy and in particular to the question of lucid, grammatical and graceful writing. Alas, instead of being cheered up, I left the meeting with a heavy heart, not so much because of any ideas expressed with which I disagreed, but rather because of the almost disinterested atmosphere which prevailed and the failure of any one to advance a program for combatting the existing situation.

At the outset of the session, one of the speakers referred to a statement issued some time ago by the American Accounting Association which might be referred to as the 50-25-25 statement. The Association at that time recommended that the ideal college curriculum for young accounting majors should require at least 50 per cent of the time to be devoted to liberal arts subjects, 25 per cent to accounting and 25 per cent to other business subjects. The speaker, as I said, referred to this pronouncement in the beginning of his talk, and despite the valiant efforts of the panel members to stimulate discussion, little more was said on the specific point at issue. To be sure, no one got up to express disagreement with the American Accounting Association's recommendations, but, on the other hand, nobody arose to suggest how they might be implemented. Instead, a somewhat aimless and extremely polite discussion ensued which finally flagged to such an extent that the round table discussion was almost terminated before the closing time arrived. I can assure you that I left the room with a feeling of the greatest dismay.

Over the last few years, I have seen a good many expressions in print, not only from the public accounting profession but from other professions, businesses, and from academicians, complaining of the almost universal inability of the college graduate of today to express himself either in writing or orally. Every one appears to be in agreement that the condition exists; yet like Mark Twain's weather, nobody seems to be doing anything about it. Apparently the whole subject is regarded as something which can be quickly swept under the rug, so as not to interfere with discussions of more important subjects such as price level adjustments, uniformity in corporate financial statements, and other such burning questions of the day. In the hope, therefore, that I may be able to shift more attention to the problem, I am writing this article, because I do feel that there is something terribly wrong with the educational processes of today which simply must be corrected if the colleges are to do their best for the young people whose education is in their charge.

I think perhaps the best way to approach the whole thing is to outline the

very personal problem that I face as a practicing public accountant, and which I am sure is common to almost all the practitioners in our profession. As in all public accounting firms, the backbone of our practice is our audit work. We send our men out, they check the clients' books, they report back to the office where they draft reports. These, after reviewing and checking, are in due course typed and issued to the clients. Essentially speaking, we are, of course, selling our services, but I am inclined to think that what many clients are really paying us for is what they—not we—call an "audit." To such a client, the term refers to a slim volume handsomely typed and bound in blue covers with a page of heavily engraved letterhead paper in front and an impressive looking signature somewhere in the text. This volume is what he pays us for and is the thing he uses to brandish under his banker's nose when he wants money. To him, this is the "audit," and the various checking procedures which we may use and the various theoretical accounting questions which we may argue with him along the way are, as far as he is concerned, very much like the sex of the hippopotamus—something which is of interest only to another hippopotamus. He is paying us for his "audit" and to him this term means a tangible written report.

I stress all of the above because I sometimes wonder whether the public at large, and particularly the young people in college who may select public accounting as a career, do not look upon it perhaps as the one vocation where they will never have to be troubled with the written word and can bury themselves for life in a mass of figures—a safe refuge where such dragons as the split infinitive, the dangling participle and the awkward phrase will never catch up with them. In other words, how many people may enter public accounting in part because of difficulty—as opposed to facility—in self expression, feeling that here of all places is a field where self expression is not required? I merely ask this as a question; I don't know the answer.

I go into all this simply to point up what is well known to all public accounting practitioners, namely that it is a writing business. I don't know how the literary output of a practicing public accountant compares with that of a successful novelist, but I would be inclined to think that in many instances the public accountant might win the race, if not from the standpoint of quality, at least from the standpoint of quantity. And if the accountant is not required to write in mellifluous cadences, think of the meticulous accuracy and clarity with which he must express himself. This at least is not something with which the average novelist has to be as much concerned. Yes, voluminous writing consumes a very large part of the time of the average practicing public accountant, and when one considers the extreme pressure under which accountants have to work and write their reports during the winter season, it becomes immediately apparent that facility at writing is just as necessary a part of the successful accountant's equipment as is proficiency in the accounting art.

Now, applying this to my own situation, I find myself, as a partner in our firm, supervising the audits of a substantial number of clients, most of whom are of such a type as to receive long form audit reports from us each year. In addition, we make it a practice to supplement our regular annual reports with additional reports or letters commenting upon the accounting and other procedures followed in the clients' offices and recommending improvements. Under ideal conditions, my life would be a relatively easy one. I would send a competent senior accountant out on the job. He would make his audit, would either solve all the accounting questions that arose himself, or would

present them to me neatly and concisely for solution. He would then draft his reports and would bring them to me. I would read through them, perhaps make one or two minor corrections, send them to the typing department and sit back to wait for the next one.

Unfortunately, such is not the life I live. About every other audit I handle seems to follow a similarly bumpy path culminating in the submission of one or more reports drafted by the senior accountant and submitted for my "review." I put this last word in quotation marks, because all too often what the report needs is not "reviewing" but almost complete re-writing. To the extent, of course, that the faults involve matters of policy—disclosure, accounting theory, etc.—it is not surprising that young seniors who are only a few years out of college frequently go astray, and in fact they are expected to do so. What is inexcusable, however, is the seeming ignorance among the majority of our young men of the basic rudiments of English grammar and style. It is the continual mistakes that I encounter in this area that are responsible for a large part of the rewriting that I have to do, and which I feel are the result—in most cases—of faulty academic training. Of course, I realize that sometimes the blame is as much the students' as the teachers'. Horses can be led to water, etc. I do not believe, however, that congenital inability or disinclination to write is the reason for the trouble in most cases. I suspect that the real answer is that the men simply have not had the proper teaching.

So far as our practice is concerned, what does all the above mean? It means simply that at the partnership level we are spending hours on English composition which could be spent far more profitably, both from our own standpoint and that of our clients, in giving careful consideration to the many accounting and tax problems which are entailed in the average audit. But what else can we do when so many of the men who come to us from the colleges cannot write? To put it mildly, our present modus operandi is inefficient, and unless something is done I am afraid that what we will all come to is the old fashioned 18th century practice of hiring hacks to do all our literary work for us, even though these individuals may know nothing of accounting. When we arrive at this point, perhaps in signing our reports we had better place after our regular firm signature the legend "As told to John Jones," as do many of our autobiographical celebrities whose talents are other than literary.

I have discussed this whole problem with a good many individuals on and off the campus, and while I myself am in no way qualified as a teacher, nor as any sort of an expert on education, I do feel that I have arrived in my thinking at what may be a solution to the problem. However, before I go into this, I would like first to brush away a few cobwebs that always seem to clutter up discussions of the subject. Chief among these is the—to me—erroneous notion that the colleges, being institutions of higher learning, are not responsible for teaching English composition to their students, and that they are therefore entitled to sit back passively and blame the primary and secondary schools for the trouble. This I think is a fallacious position. I would agree with them that, under ideal conditions, they *ought not to be* responsible, but so long as the lower levels fall down on the job, as they doubtless are, I maintain that the colleges have no alternative but to bridge the gap. Theirs is the final stage in the educational process; theirs is the responsibility for safeguarding the integrity of the degrees they award. If the students who enter as freshmen are ill-trained, then it is up to the colleges to teach 'em or flunk 'em. I can see no third way out of the dilemma.

The next point to be considered is how English is to be taught, if it is to be taught.

It is my belief—and I believe that I am supported in this by many English Department faculty members—that English composition and style, like almost everything else in this modern world, must be taught by experts, and ought not be entrusted to unskilled hands. I stress this particularly strongly because in almost every discussion I have ever heard among accounting professors and accounting faculties the final suggested solution always seems to be that the accounting professors should introduce the subject of English writing and English composition into their accounting classrooms, and endeavor not only to teach their students accounting, but also to teach them how to write, as a sort of by-product to their own pedagogical line. As an illustration of an endeavor such as this, I find that one State society is now offering a course in audit report writing which deals partly with content and partly with expression. This course, which is patterned upon the report writing course developed by the American Institute of Accountants, will be taught by a member of the accounting faculty of one of the local universities. No doubt, it will turn out to be a very excellent job, certainly insofar as content is concerned, and perhaps also the instructor may be able to inculcate in his students some awareness of English prose construction. The fact remains that he is first and foremost an accountant, and only secondarily a teacher of English. As a teacher of accounting, he is doubtless a whiz, but if he is also an expert teacher of English it would be no more than a fortunate coincidence. After all, would one expect a gifted English teacher to be an expert on consolidated financial statements?

At this point we arrive at a third fallacious premise that eventually seems to steer discussions off the track, and this is the idea that one can be good at "report writing" without being good at other kinds of writing. The American Institute offers a course in report writing, and many of the colleges have similar courses, including some called "business letter writing." Implicit in all of these, it seems to me, is the thought that somehow or other you can compartmentalize the elements of English style into business and nonbusiness groupings—infinitives to the right and participles to the left—so that our young tycoons of tomorrow will become proficient in "yours-to-hand-and-contents-duly-noted" without ever having to involve themselves in matters Dickensian. This I maintain is a false concept, because good writing after all is good writing, no matter what it is about. If a person can write well, he can write a good audit report, assuming that he is technically competent. If he is not familiar with the principles of prose construction, his reports will always be second-rate affairs, no matter how much double-entry he knows. Of course, audit report writing does need specialized training—part of which can be acquired in the classroom—but this type of training should not be confused, as I think it may have been, with basic instruction. It is in this latter area that the colleges have been woefully remiss.

I now find myself getting perilously close to making concrete recommendations as to how young people can be taught to write good English. The fact is that I myself am not qualified to make any such recommendations, and it is with this very extreme reservation that I offer the suggestions that follow. First of all, I do not think that the teaching of English composition is a brief process. To learn how to write, a student must be required to write a great deal, and this means that any course given in the subject ought to cover at least two consecutive semesters. Second, I do not think that the training can be accomplished by the lecture method. While a certain amount of time must be spent in lecturing on the elements of English style, the student will receive his

main training from having his own compositions critically reviewed by experts and discussed with him across a table. In other words, the job will require considerable faculty manpower, if any significant number of students is to be trained. Here one must inevitably run into college budgetary problems, and the best I can suggest on this score is that the services of graduate students be enlisted to supplement the faculty members who conduct the courses. I have heard of one successful college course that operated on this basis with a considerable number of students, and men who have taken it tell me that they benefited from it immeasurably and could remember what they were taught long afterwards. I do not know the exact details of this course, but I gather that the students enrolled in it had to turn out veritable reams of written matter during the course of the academic year, winding up with some such tremendous work as a short novel. Exactly how all of this outpouring was reviewed by the faculty in charge, or how the expense of running the course was fitted into the college budget, I do not know. The approach, however, seems to have been the correct one.

I realize that what I am suggesting is likely to prove disruptive of the curriculum in the average school of business administration, but I believe that almost any amount of disruption would be justified if the end result can be achieved. Not only must interdepartmental budgetary and faculty problems be solved, but I suspect that in many institutions a considerable measure of student opposition will have to be overcome. A friend of mine in one business school has told me that at his institution the best they have been able to do to teach their students how to write has been to offer a course in "business letter writing." He said that if they took the word "business" out of the course caption none of the students would take it, so firmly imbued with the vocational idea of education are the young people who enroll at that particular college. I suppose that this attitude reflects parent unawareness of the value of a general education, and that long before the young people ever appear at the university's doors they have had their heads filled to the brim with the idea that nothing that is not vocational is worthwhile. Nevertheless, I believe that the college faculties have a duty to correct this false impression, even at the risk of some initial lack of popularity. If they wish, they can certainly find plenty of evidence that inability to write well is doing as much damage to the careers of young people who go into the business world, as almost any other single deficiency for which the universities and schools may be held responsible.

Well, to summarize this rambling dissertation, it is my feeling that at the present time not enough is being done in the university world to bring home to the students how important good writing is, and to teach them how to become adept in it. Second, I am convinced that the job is not something which can be or should be handled by the faculty members in the schools of business administration who are concerned with the teaching of business subjects, but rather should be turned over to specialists in English teaching. Lastly, I believe that provision should be made in every required course leading up to a B.B.A. degree (or any other college degree, for that matter) for at least a full two semester course in English composition and style, consisting of intensive writing and criticism, writing and criticism, and more writing and criticism. This course should be given no matter how steep the cost, and regardless of what vocational or other courses may have to shelved in its favor. I am convinced that any measures short of this will fail to do the job. I also suggest that time's a-wastin'. Let's get to it!

CHOICE AMONG ALTERNATIVES

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IDEAS are mobile units, in some respects not unlike freight cars in a marshalling yard. Every switchman and every builder of verbal models knows that the units may be marshalled into a train by starting at either end. The switchman, however, works under certain restrictions: someone else has brought the units into the yard, hence he has no choice of the units to be included; his objective is set for him—place the units in a sequence which will facilitate dropping each at the proper station with a minimum of train switching.

The verbal builder, however, chains ideas into idea-models with a relatively free hand: he can choose the units to be included, selecting among alternative ideas the ones he thinks most desirable; his arrangement of units is also of his own choosing; his objective is a simple one—that of choosing and arranging idea-units in a manner convincing to himself and persuasive to his readers that by his sequence of thought (or assumption) another idea (conclusion) has been given creditable support.

The fact of the matter is that there are two ways of thinking of accounting theory.

One way is to consider the theory as the many explanations, reasons, justifications which will help us understand why accountancy (technology and profession) is what it is. Judging by some of the recent literature, the other way is to aim at constructing one, all-embracing theory of accounting. This "model" would be a tightly reasoned argument arranged to justify ever wider applications of accounting to new situations.

There has been far too little demonstration in the literature of the first way of thinking of accounting theory. One result is widespread belief, particularly among non-accountants, that accountancy is more conventional than rational; more traditional than progressive; and that it is for the most part a loose collection of useful arts without a philosophy to cement the separate parts into an integrated whole.

Yet, whenever we are able to examine the long-developing ideology which has inevitably been associated with the practical use of accounting, the conviction grows that accountancy is both rational and progressive, and that its parts are being welded into an integrated whole by the actions and choices of men close to the uses of the technology.

The other view of accounting theory is being reflected particularly in some of the items in the literature which suggest in one way or another that "economic engineering" (control of the economy?) needs better data for its use than that supplied about enterprise net income by the usual process of accounting. Sometimes this view appears in the form of advocating the injection into accounting processes of cost figures as adjusted by application of a price index series. Again, it may appear closely associated with a plea for the formulation of "a theory" of accounting.

Clearly the latter concept is quite different from the former. For theory, as explanations, reasons, justifications, does not contemplate producing "a" theory, that is, a didactical arrangement of ideas which persuasively presents a series of compact propositions, beginning with a broad, distant premise (assumptions?) and

emerging at a predetermined point with a more-or-less predetermined conclusion.

Because these two approaches to accounting theory are quite different, it may be of interest to examine the possibilities for choosing assumptions suitable for supporting differing conclusions.

The view has been expressed[1] that it is possible to frame a theory of accounting without reference to the practice of accounting. "Since the fundamental premise for a theory lies outside of the field of accounting proper . . . the following propositions therefore seem necessary" (as a basis for the theory). The author continues with these four propositions:

"(a) Certain organized activities are carried out by entities which exist by the will or with the cooperation of contributing parties.

"(b) These entities are managed rationally, i.e., with a view to meeting the demands of the contributing parties efficiently.

"(c) Statements in monetary terms of transactions and relationships of the entity are one means of facilitating rational management.

"(d) The derivation of such statements is a service function."

Considered in connection with the author's development of this thesis, these stated premises from outside of accounting technology seem to be derived or to be derivable from a sequence of implied alternative choices which can perhaps be formulated as follows:

1. We may choose to assume either that the various kinds of enterprise which can use accounting data are basically alike in important particulars, or that it is their differences which are significant and controlling.

2. We may choose to assume either that intentional actions by enterprise management are likely to be significantly rational, or that they are likely, by neglect of reasoning, to be largely intuitive and imitative.

3. We may choose to assume that accounting symbols, being units of local currency, should be considered either as representing a stable value of money, or as representing an unstable value of money.

4. We may choose to assume either that the preparation of account data and financial statements, as a service function of a service instrumentality, can be carried on according to established custom and tradition, or that preparation can be carried on in whatever manner may be appropriate to providing the kind of data the users will need.

The author seems to believe that the alternatives here stated last are the significant ones. The resulting sequence of choices is brought to a focus which, it turns out, gives support for a certain conclusion about presumed accounting deficiencies.

1. Differences between modern entities are significant and controlling. (Therefore the entities need account data suited to the peculiarities of each?)

2. Actions by entity management are likely to be intuitive or imitative. (Therefore entity management needs assistance toward rational bases for decisions?)

3. Account symbols should be considered as representing an unstable value of money. (Therefore a change in accounting technology is needed? That is, a change to prevent the misleading intermingling therein of the effects on net income of price level change—an external condition—and on managerial judgment—an internal condition.)

4. Accounting is a service technology. (Therefore its service should be such as will provide whatever the kind of data users need?)

Standing alone without the parenthetical clauses, each of these chosen alternatives could strike a responsive chord in the minds of many practitioners; for each

[1] For example, "Blueprint for a Theory of Accounting," by Professor R. J. Chambers (University of Sydney), *Accounting Research* (London), January 1955.

assumption is perhaps not so much "from outside accounting" as might be imagined.

Consider each item by itself. In system work the accountant cuts the cloth to fit, and he usually is skeptical about uniform accounting systems.

The independent public accountant knows, perhaps better than most people, how often managerial decisions have been intuitive—that is, self-centered, short-sighted, wishful thinking. Is it too much to say that professional accountants have persisted throughout the past one hundred years in their efforts to reduce the tendency of some people to try to make inanimate account data show what the human being wished to see?

Accountants, along with nearly all of the population, have been aware of changing price levels. In the view of all these non-economists, changing prices tell us unstable value of goods and services rather than of unstable value of money. It is not convincing to hear it said that these people mistakenly assume a stable value of money. The man who has goods while wanting money, and the man with money wanting goods, will each appraise the two economic elements in relation to his wishes. He may or may not note that the "value" of each is the reciprocal of the other. Business men and accountants, most people in fact, choose to make their decisions by thinking of the goods aspect; the remaining few believe better decisions would result from thinking of the money aspect of the reciprocal.

Professional accountants have long struggled with the problems of providing data needed by managements and investors. As a result of an extensive accumulation of experience, accountants have come to several relevant conclusions: that men often want, and need, data which are not within the function of accounting to supply or practitioners to certify; that it should lie within the province of people specially trained and experienced in accounting to set the limits of their technology in the matter of supplying all information a client might find useful; that the professional accountant should confine his professional work of dealing with objectively derived and convincingly verifiable data which have been collected and marshalled by well-known procedures from evidence of actual business transactions; that there can be no objection to any desired amount of collateral, interpretative use of properly derived account data, including such devices as averages, ratios, trends, and projections.

Although the importance of each of the alternatives chosen will not be strongly disputed by practical accountants, it does not follow that all aspects would be endorsed, or that the sum of the several subconclusions as indicated would be considered as leading to a generalization convincing to most accountants.

The principal generalization drawn by the original author from such a chain of assumptions is, in effect, that account data prepared under guidance of his four propositions would "incorporate features which economists have found it useful to adopt in studies of business behavior and social problems." Specifically, this refers to account figures modified by application of a statistical index of price level change.

This generalization could be considered to be justified as the logical consequence of this selected choice of assumptions.

Additional support would be afforded by the following propositions:

(1) "Social accounts" (presenting the national economy in tables of interrelated figures) can usefully serve an "entity" which is quite different from other account-using entities; these social accounts need business income figures as adjusted for price level change.

(2) Decisions of importance rest upon data descriptive of the entity we call "the national economy," and these decisions

can be more soundly rational for that entity if business income figures are expressed in economic fashion.

(3) Accounting symbols (money price of transactions) need to be cleared of the effect of price level change before being used in economic analysis. This adjustment is desirable in order to measure separately the effect of the totality of business decisions.

(4) Accounting as a service technology should serve this entity (central government?) as well as other entities.

It will be observed that this series of propositions tends to support the stated generalization. However, suppose we start with a different tentative generalization. Could we rationalize it into a conclusion by assembling several individually persuasive propositions?

In order to try this procedure, let us take the following as the tentative generalization—an opposite of the one above—and try to support it by a chain of assumptions based upon the unused parts of the several alternatives outlined previously. It will make the issue clearer if the assumptions are called up in reverse order.

Tentative Generalization: Business accounting should not be distorted out of its natural limitations by the injection into this technology of revenue charges which have been modified by application of an index series of price level change. *Corollary:* Supplementary interpretative disclosures of price change effects would effectively serve all users without constituting distortion of established technology.

Of the several alternative choices of premises, consider the following:

(4) It will support the tentative generalization if we can justify the assumption that the preparation of accounting data and enterprise financial statements can best be carried on according to established accounting technology.

(3) It will support the tentative generalization if we can justify the assumption that, in using money price of enterprise transactions as quantitative symbols of measurable activities, we need only think of the symbols as representing goods and services considered relevant to this enterprise.

(2) It will support the tentative generalization if we can justify the assumption that actions by enterprise management today are likely to be significantly rational.

(1) It will support the tentative generalization if we can justify the assumption that various kinds of entities which can use account data are basically alike in important particulars—especially in these features which are in tune with the central and controlling characteristic of accounting.

Assumption 4 above may seem merely to reflect blind adherence to old ideas and neglect of new ideas. Yet the fact is that the known course of accountancy's modern development clearly indicates a willingness of the part of business men and accountants to extend the services of accounting and to improve its techniques.

Older ideas have been abandoned or modified to meet new situations. The American voluntary audit for credit purposes was a deviation from the British statutory audit of company directors' stewardship. New ideas, if deemed relevant to accounting and well within its limitations, have been supported by accountants: standard costs in factories, accounts for appropriations and commitments in fund accounting, the Lifo formula, for example.

The acceptance of these ideas and their introduction into the accounting framework, surely must weaken any belief that accounting techniques are so rigid as to be beyond change. Change there has been, but always it has been kept within certain limits. Imputed interest as a cost has been injected because, since it does

not arise in an objective transaction of this enterprise, its use would inject unilateral, hypothetical figures not tied to bilateral, bargained transactions.

The thought at once arises that standard costs also are hypothetical figures. The answer is that standard costs, and even Lifo, are firmly tied to enterprise actualities in a way not seen in the case of imputed interest and index-modified revenue charges. Lifo is based on actual exchange-priced transactions of this enterprise; accounts for variations from standard cost tie the latter to invested costs. Fixed asset depreciation is not properly determined by managerial fiat as may be convenient. Depreciation changes can be denied admission to the status of a cost only at the risk of making very misleading disclosures of the real situation as to enterprise net income.

In accepting changes into accounting technology, ideals are in control: the most truthful accounts, statements which provide full disclosures. It is the objective of accountants to attain and hold these ideals as closely as possible. It is to this end that the integrity of the framework of systematic methodology is maintained, that is, so that the data from this methodology, and the appropriateness of system operation, can be critically reviewed as to relevance to the enterprise in question and as to factual accuracy.

Assumption 3 emphasizes two points: money prices are symbols of nonmonetary realities; the realities in question are goods and services and contractual obligations which are clearly relevant to the given enterprise. Enterprise action deals with these realities; the service capacity of goods must be considered before the financial, the money side, can have meaning. Goods and services are acquired in an effort to attract customers, that is, to serve the public. The price tags of these diverse efforts are significant; but not so much from expressing purchasing power of money as from rendering diverse efforts homogeneous and quantitative—this so that these efforts in due time may be brought into arithmetical relationship with achieved results which have also been rendered quantitative by agreed exchange-priced transactions.

The use of money prices other than those associated with transactions of this enterprise would clearly introduce irrevelant data into the record, thus injecting an unethical element of misrepresentation. Moreover, systematically restricting the source of account data to transactions of this enterprise also has the desirable effect of making verification more feasible.

The price of the goods purchased is a natural fact with which business men must of necessity consciously concern themselves; the causal factors back of that price are not. Supply and demand for goods and services is a causal factor which is a direct consequence of the mass of individual economic actions. Statistics tending to reflect change in these elements provide helpful information for management use, yet do not in themselves modify accounting procedures.

Another important causal factor is the available supply of money and credit. And this is subject to planned controls exercised by statutory authorities. It is beyond the function and power of business men as individuals—though within the authority and power of the Federal Reserve Board—to determine over-all fiscal policy, and thus affect the price level.

Under these conditions, how would knowledge of "changing value of money" as money help the business man? One man's study of current fiscal policy is not likely to increase his ability effectively to serve his clientele; his study of the prices of goods would.

To pose business men and accountants with a necessary choice between consider-

ing money units as representing a stable or an unstable value of money, is equivalent to implying that each man of them should consciously act in the interest of the economy as a whole. Would not they then be forced to neglect their primary responsibilities to their own constituencies when they consciously tried to share in the control of the national fund of money and credit in order that price fluctuations for the whole economy should be suitably influenced?

For business men, data of the changing prices of goods and services are significant; for current policy makers, data of the changing purchasing power of money are significant, since these people are charged with taking action to influence the nation's business. Is it not, therefore, largely a confusing exercise of semantics to make it seem that business men and accountants have a responsibility to act with conscious choice as to whether the "value of money" is stable or unstable?

Assumption 2 makes the point that enterprise management today is much more rational than intuitive. The latter kind of management presumably would not use data indicative of larger-than-local conditions, thus the significance of changing average price levels would be missed. Is this the reason his accounting should be changed, so that the larger scene will be inescapably spread before his mind?

No doubt there are many men making business and investment decisions who do not research their way into decisive action. Yet many of them, perhaps most, are able to manage with satisfaction to their stockholders, employees, customers, bankers, tax collectors, and themselves.

May there not be an important element in successful enterprise management which theorists without administrative experience or responsibility could easily overlook, or too sharply discount? Good business judgment is a vital factor in management; and it cannot be satisfactorily compressed into a phrase, "always act to maximize the profit."

Judgment is an element which does not lend itself to definition; formal education is at most an uncertain factor in the creation of good judgment. Judgment grows best as it feeds upon responsible, rather than vicarious, experience. The raw materials of experience are the details and peculiarities of a particular enterprise, of its customer clientele, of its material and labor markets. Then follows knowledge, in the same pattern, of the industry concerned. This is a long way from study of the economy as a whole, perhaps so far away that most businessmen cannot indulge in broad studies and still meet the duties of the day at the office. Yet, this doing first things first seems to have proved satisfactory throughout the centuries. Men apparently were able to develop good judgment before statistical methodology and economic doctrine were available to guide them. There is little evidence that, as a class, they did not manage "rationally." By what other road have we come to the present stage of industrial development?

There is plenty of evidence of the use of techniques of rational management. The modern development of controllership, forecasting, market surveys, personnel testing, all of these, though non-accounting, indicate growth of rational management by use of devices designed to sharpen and broaden judgment based on experience.

Accounting as it is can well be called the oldest technical aid to rational management. Over the centuries it has been reporting, after the fact, on the status and effectiveness of prior managerial decisions. This highly useful reporting continues today without having felt a need for departure from the use of accounts which consistently stated past efforts as measured in terms of exchange-priced transactions.

Nor is there convincing evidence that any significant portion of the total mass of business and investment decisions based on such account data was anything but rational. Disturbing instances of bankruptcies and losses by security holders have usually been related to neglect of account data, outright fraud, or to conditions unavoidable through a knowledge of accounting data.

In fact, the astonishing accomplishments of modern business seem of themselves to be the strongest argument in support of the tentative generalization posed above. Since accounting technology in its usual form has served during this period, and has steadily grown under those conditions, it is only reasonable to believe it has served well as an instrument in aid of this achievement. If this is true, it would also seem reasonable to believe that the natural limitations of accounting technology have not stood in the way of its ability effectively to provide its kind of service under new and different conditions. Where these limitations have been reached, supplementary techniques have been constructed and have demonstrated in use their ability to contribute as expected.

Business does indeed need rational management. The need has long been recognized. How else explain the advances made in managerial techniques and skills? It is noteworthy that the present degree of rational management has been achieved without damage to any of the earlier instruments used in aid of rational business judgments. Non-accounting techniques, by acting within their own function, supplement rather than change the natural limitations inherent in accounting.

This kind of useful approach has again been proposed as a satisfactory way of augmenting the information service of accounting: specifically, a supplementary, quasi-statistical statement presenting a calculated effort to separate the effect of changing price levels upon revenue changes and net income, and to suggest in the resulting residual figures the effect of managerial decision as such. This arrangement will leave account and financial statement technology unchanged. It would seem also to offer the kind of special information which special interests have indicated would be particularly useful to them. Yet the literature critical of accounting "realism" shows few signs that this solution is satisfactory to the critics. Can it be that an urge to effect a reform in accounting technology is more persuasive than securing the specified data? If published reports are slow to include a supplementary income calculation, that could no doubt be changed by request of the people qualified to present the views of the principal users of accounting data, such as business management and investment counsel.

Assumption 1 entertains the idea that similarities among enterprises using accounting data are of controlling significances.

Here is a case of important similarities existing among relatively less important differences. Because this is so, it is similarities not differences, which make accounting an appropriate technology in individual applications. Like other technologies, accounting cannot be all things to all men. Accounting lacks universality, and accountants will not be persuaded otherwise by assertions that it ought to be rested upon principles of universal truth. It is doubtful, for example, whether applying the word "accounting" to the recording system used in totalitarian countries does anything to make accounting universal in fact. It will not be a record system dedicated to the truthful analysis of exchange-priced transactions and presentation of the distinction between, and interrelations of, capital (real accounts) and income (nominal accounts).

Other systems for producing managerially useful data can no doubt be constructed, and may suffice for this purpose. But these would need to include certain definite characteristics and limitations to be in fact what the word "accounting" has come to mean to us. A useful arrangement of data is being used under the name of "social accounts." The use of the adjective here makes it clear that a distinguishing adjective might well be used elsewhere: as in "business accounting." Somewhat the same kind of misunderstanding could arise from overgeneralization of the word "democracy."

It may be complimentary to use the word "accounting" in non-characteristic applications. But it will trouble many accounting technicians to see efforts made to introduce modifications into their technology in order that the resulting data shall be more suitable for direct use in certain non-characteristic situations.

The distinctions here considered are illustrated by two types of accounting adaptations. Many features of business accounting, particularly those facilitating internal control, are rapidly being put into use in various operating divisions of the Federal government. In sharp contrast is the adoption of certain surface features of account classifications to form statistical tables given the name "social accounts."

The first adaptation will make its contribution by increasing operating efficiency; the second adaptation is expected to make its contribution by promoting analytical study of change among several segments of the whole national economy. The first adaptation takes accounting as it is and, as is done in fund accounting, uses all account classifications except those dealing directly with dedicated capital and profit; the second adaptation appears to furnish the primary impulse toward advocating the idea that throughout business accounting the invested cost figures (risked capital) should be modified by application of a price index series.

This proposed modification contains an over-emphasis on an economic idea (purchasing power) in association with a tendency to believe, erroneously I think, in the validity of the assumption that accounting, because it is a service technology, should be able, and accountants should be willing, to modify its technical features as may seem useful to any type of entity. Accounting has registered, in use, a marvelous adaptability. But close examination of its many differing forms will show there are limits beyond which adaptation may become emasculation.

The existence in practical use of variations *from* the original Italian scheme of business records (adaptation) should not be considered indicative that variation *of* accounting (basic modification) will be easily sold to its technicians.

Accounting is indeed a service technology, but since accounting cannot offer a universal service to all types of entities, one of the basic premises needed for "a theory of accounting" seems not to support a conclusion in favor of modifications by application of index numbers. So, too, the other basic premises come into question as to their place in a chain of reasoning leading to the same conclusion.

The flexibility of the several semantic arts—of assembling chosen alternatives, of adducing reasons in support, of chaining assumptions into a sequence—has been suggested in this presentation. The conclusion of the experiment can perhaps be put this way: different switchmen probably would organize a train of freight cars very much alike; different builders of verbal models, having differing conclusions in mind, probably would construct differing chains of reasoning.

AMERICAN ACCOUNTING ASSOCIATION

1956
Convention

UNIVERSITY OF WASHINGTON
SEATTLE
WASHINGTON

August 27-28-29, 1956

AMERICAN ACCOUNTING ASSOCIATION

Preliminary Program for the 1956 Annual Convention

MONDAY, AUGUST 27

9:00- 5:00 Registration
2:30- Steamboat Ride and Salmon Bake

TUESDAY, AUGUST 28

9:30-12:00 *Session I*

Presiding: ALMAND R. COLEMAN, University of Virginia; Vice-President, American Accounting Association
Subject: FACULTY DEVELOPMENT
Papers: *Evaluation of the Faculty Members*
LLOYD S. WOODBURNE, Dean, College of Arts and Sciences, University of Washington
Publication and Research by the Faculty
SIDNEY DAVIDSON, Johns Hopkins University; Director of Research, American Accounting Association
Professional Development of the Faculty Member
S. PAUL GARNER, Dean, University of Alabama

12:30- 2:00 Luncheon

Presiding: ANDREW BARR, Securities and Exchange Commission; Vice-President, American Accounting Association
Greetings: THE HONORABLE CHARLES MEREDITH HARRIS, President of the Board of Regents, University of Washington
Speaker: DIXON FAGERBERG, JR., Vice-President, American Institute of Accountants

2:15- 4:45 *Session II*—Round Tables

1. NATIONAL INCOME ACCOUNTING
Chairmen: MARY E. MURPHY, Los Angeles State College and JOHN P. POWELSON, International Monetary Fund

2. REPORT OF THE COMMISSION ON STANDARDS OF EDUCATION AND EXPERIENCE, AND PROFESSIONAL EDUCATION IN ACCOUNTING
Chairmen: C. AUBREY SMITH, University of Texas and LAWRENCE L. VANCE, University of California (Berkeley)

3. WHAT AN EMPLOYER EXPECTS OF THE COLLEGE GRADUATE
Chairmen: DONALD H. CRAMER, Touche, Niven, Bailey & Smart and VICTOR Z. BRINK, Ford Motor Company

4. CURRENT GRADUATE PROGRAMS IN ACCOUNTING
Chairmen: ROBERT H. VAN VOORHIS, University of Alabama and LLOYD F. MORRISON, Louisiana State University

5. ACCOUNTING AND FINANCIAL CONTROL, DEPARTMENT OF DEFENSE
Chairmen: HOWARD W. WRIGHT, University of Maryland, DANIEL M. SHONTING, Ohio State University and HOWARD BORDNER, Department of Defense

Note: Tuesday evening will be a free evening with no program activities scheduled. Information as to available entertainment and recreational activities will be furnished upon arrival.

BETA ALPHA PSI

The annual meeting of the Grand Chapter (faculty vice-presidents and past presidents of the Grand Council) will be held Tuesday evening, August 28, at 6 o'clock.

WEDNESDAY, AUGUST 29

9:30-12:00 *Session III*

Presiding: C. A. Moyer, University of Illinois; Vice-President, American Accounting Association

Subject: TENTATIVE STATEMENT OF COST CONCEPTS UNDERLYING REPORTS FOR MANAGEMENT PURPOSES

Papers: *The Nature of Business Costs, General Concepts*
NORTON M. BEDFORD, University of Illinois

Costs for Control
ROBERT N. ANTHONY, Harvard University

Costs for Planning
EDWARD L. WALLACE, University of Buffalo

An Evaluation of the Tentative Statement
JOHN O. YEASTING, Vice-President, Boeing Airplane Company, Seattle

12:30- 2:00 Luncheon and Business Meeting

Report of the Secretary-Treasurer
Report of the Director of Research
Report of the Editor
Report of the President
Election of Officers

2:15- 4:45 *Session IV*—Round Tables

6. MANAGEMENT SERVICES BY PUBLIC ACCOUNTANTS

Chairmen: RUSSELL H. HASSLER, Harvard University and DONALD M. RUSSELL, Lybrand, Ross Bros. & Montgomery

7. THE PLACE OF ELECTRONIC DATA PROCESSING IN ACCOUNTING INSTRUCTION

Chairmen: ROBERT H. GREGORY, Massachusetts Institute of Technology and RICHARD F. PIERCE, University of Illinois

8. THE CONTENT OF THE C.P.A. EXAMINATION

Chairmen: BRUCE FUTHEY, New York University and ROY C. COMER, President, Washington State Board of Accountancy and Association of C.P.A. Examiners

9. CURRENT PROBLEMS IN TEACHING INCOME TAX ACCOUNTING

Chairmen: CHARLES E. JOHNSON, University of Oregon and JEROME J. KESSELMAN, University of Denver

10. USE OF VISUAL AIDS IN THE TEACHING OF ACCOUNTING

Chairmen: KENNETH W. PERRY, University of Illinois and LAUREN M. WALKER, University of Washington

6:00- 6:30 Social Hour

6:30- 9:30 The Banquet

Presiding: JOHN ARCH WHITE, University of Texas; President, American Accounting Association
Presentation of Alpha Kappa Psi Award
Introduction of President-Elect, 1957
Entertainment

REPORTING ON THE FLOW OF FUNDS*

MAURICE MOONITZ
Professor, University of California, Berkeley

IN THE conduct of an enterprise, management has two major financial tasks of importance to accountants, namely,

(1) to operate the enterprise profitably; and
(2) to finance the activities of the enterprise and to keep it solvent.

In the case of nonprofit activities, the statement of the first task should be modified to indicate that management is charged with making the enterprise perform within its prescribed limitations, such as a budgeted amount of expenditures.

With respect to the first task, accounting has done a good job. That is to say, the necessity of a formal report on the results of operations is widely recognized, and the numerous problems involved in its preparation have received close and earnest attention among all groups and at all levels. With respect to a report on the way management has discharged its second task, our performance is less satisfactory. It is true, of course, that both the flow of funds into and out of an enterprise, and the effects of its financing activities, are recorded in the books, but a formal statement or report is typically not prepared.

The statement of the sources and the applications of funds is an attempt to report on the second task of management, to fill a gap usually left open in the typical published report. The statement is, therefore, a supplement or addition to the conventional battery of statements, not a substitute for them in whole or in part. Assertions, for example, that a funds statement is better or worse than an income statement are unfortunate. The two statements have different functions; both suffer from attempts to set them up as rivals.

The need for a statement to report changes and movements not clearly reflected in the balance sheet and the income statement has long been felt. In this country, the attempt to construct such a statement is usually dated from the publication in 1915 of William Morse Cole's *Accounts: Their Construction and Interpretation*. In that book, Cole described his "where-got-where-gone" statement. But progress was slow. In 1929, Myron M. Strain wrote in his *Industrial Balance Sheets* (page 132), "The statement of application of funds had best be described, as it is one of the most useful of accounting statements and deserves frequent use; but it may be dismissed briefly, because it does not get it. This exhibit details the sources from which all the funds used during a fiscal period were derived, and describes the uses to which they were put. It is a striking and significant interpretation of the changes that have taken place in financial position between two periods." Hector R. Anton, in the October, 1954 issue of the ACCOUNTING REVIEW has published a report, "Funds statement practices in the United States and Canada." Anton notes that, according to his survey, 68 per cent of the companies involved used a funds statement in some way or other, but that only 19 per cent included such a statement in annual reports to stockholders.

The two managerial tasks under discussion are, of course, related. It is suffi-

* This paper was presented at the Third Northwest Graduate Accounting Study Conference, Seattle, September, 1955.

cient for present purposes merely that they are not identical. As a matter of fact they tend to merge into a single problem or task over the entire life of an enterprise, or, as a practical approximation, over a substantial time period. That is to say, over the long pull, a profitable concern will also be a solvent concern, although the reverse proposition, namely, that a solvent concern will also be profitable is manifestly not true. Over a relatively short period of time, however, profitability and solvency are almost independent of each other, sometimes almost antagonistic goals. Numerous cases are at hand in which enterprises expanded rapidly and profitably, but with a tremendous strain on working capital in the form of overextended receivables, swollen inventories, top heavy current debt, and a marked shortage of cash. Similarly, other cases exist of concerns which are unprofitable for several years on end, yet actually improve their debt-paying ability in the process of contraction. The apparent paradox of profitability and solvency moving in opposite directions is not new, nor is it real in the sense of persisting indefinitely. But in the short-run, the two attributes pose two distinct problems; it is helpful to prepare accounting summations of them at frequent intervals.

To follow the point just made as to the relationship between profitability and solvency, we comment on the functions performed by the balance sheet and the income statement. The initial balance sheet of a newly-formed concern is usually also a good statement of funds—it reflects among the assets the results of the applications of funds acquired from the sources listed among the liability and proprietary items. Since operations have not commenced, the problem of profit-measurement does not arise. As a practical approximation, even a balance sheet prepared a little later on will also serve as a statement of funds. For example, this would be true in the case of a company with an extended development period during which little or no revenues arise, followed by an operating period in which additional development work was negligible. But at some relatively early point along the way after operations have begun, the balance sheet, standing alone, begins to lose its function as a funds statement.

At the other extreme, an income statement for the whole life-span of an enterprise would serve as the backbone of a funds statement covering the same time-interval. It would not be complete, because, to the revenues (sources) and expenses (applications) detailed in the income statement we would have to add at least (a) the long-term borrowings and repayments, (b) the issues and redemptions of capital stock, and (c) the dividends declared. But the combination of the items just listed would produce an eminently satisfactory funds statement, without the intervention of a balance sheet. Notice that even the depreciation charge becomes an application of funds in this statement, because over a long enough period of time the summation of depreciation charges approximates quite closely the actual investment in the corresponding assets. As in the case of the balance sheet, some practical approximations can be introduced. For example, an income statement covering 50 years, supplemented by data on long-term financing and on charges and credits to surplus, would undoubtedly be acceptable as a funds statement. But as the period covered by the income statement was shortened, the need for adjustments or modifications of some kind would begin to be felt in order to convert the income data into funds data.

As a consequence, neither the balance sheet nor the income statement taken alone will give the story of the financial flows for the relatively short periods of

time (one year, five years, ten years) covered in reports submitted to stockholders or prepared for top-management review. But these considerations with respect to the two conventional statements as potential exhibits of the flow of funds are worthwhile for two reasons, (1) they indicate why a separate statement of funds is ordinarily desirable or even necessary for a complete reporting, and (2) they indicate the limited but by no means rare cases in which one of the conventional statements will double in brass and serve the purpose quite adequately of a complete reporting on management's performance of both tasks.

II

According to Anton[1] "in essence, funds analysis is the study of the flow of funds into the business unit and the uses for which such funds flow out during the same given time period." External transactions, then, are involved; so-called internal transactions, or transfers, amortizations, and accruals, do not constitute part of the funds flow. This emphasis is both proper and important; in fact it constitutes the first principle underlying the statement. All the examples of funds statements that I have seen that are internally consistent, logical, and useful in throwing light on the financial activities of a concern make this distinction in some form or other.[2]

To help visualize the problem, a classification of financial flows is attached as Exhibit "A". Basically sound, the classification is not put forward as being necessarily the best one that can be devised. The purpose of the classification at this point in the discussion is to make fairly concrete the kind of thing we are talking about. A good funds statement, then, would include some or all of the items included in this classification; it would exclude other kinds of items found in the accounts of an enterprise or in its conventional accounting statements. For those who like to play with permutations and combinations, this classification is material for your recreation. Just by way of illustration, let us take the conventional form of funds statement as it has appeared recently in some annual corporate reports, that is to say, a statement accounting for variation in net working capital. Such a statement would show explicitly, if at all material, items 1, 2, 5, 6, and 7 under sources as well as under applications; these items might be shown "broad" or "netted." Items 4 and 4(a) under both captions would be combined in a net source of funds from operations (i.e., profit before depreciation and other "nonfund" charges to operations); item 3 would probably not be shown at all but instead would be buried in net working capital itself.

If it has escaped attention, one other characteristic of the classification should be stressed. Each item in the classification constitutes part of a "flow", a movement, and refers to the amount received, for example, from customers during a given time period. None of the items is a balance on hand at any point of time. The scheme is therefore incomplete because it does not tie into anything. But it can be made complete (in the logical sense) by relating it to a "funds balance" at beginning and end of period; this can be done in several ways. One form which appears satisfactory is appended as Exhibit "B."

Before the formal, technical problems of the statement are discussed, a word of caution may be in order. It is easy to become overly enthusiastic about the funds statement, an enthusiasm not justified by

[1] Hector R. Anton, *A Critical Evaluation of Techniques of Analysis of the Flow of Business Funds*. Unpublished Ph.D. dissertation, University of Minnesota, 1953.

[2] The importance for funds analysis of the distinction between external and internal transactions is emphasized heavily by Louis Goldberg, "The Funds Statement Reconsidered," THE ACCOUNTING REVIEW, October, 1951, pp. 485–91.

the capabilities of the instrument. True, the funds statement does supply information not otherwise available in conventional statements, but remember that it "reverses the accruals" and ignores "internal transactions." Therefore, in at least one respect it is a cruder device than an income statement or a balance sheet. The "cash-profit" approach of some discussions of this problem can easily be overdone, and raise more issues than it resolves.

The positive uses of the funds statement and the reasons for the recent upsurge in its popularity are interesting. For one thing, the recent inflationary movement in this country, associated with a high level of business activity and high tax rates, has posed financing problems on a scale so large as to constitute really new problems to American business. A statement of source and application of funds becomes useful in explaining why a net profit of a million dollars is not identical with an increase in funds of the same amount, available to increase dividends or raise wages. For another thing, the rapid changes of prices in an inflation make comparisons of income statements difficult; a flow of funds analysis may help by submitting a more elementary, less sophisticated type of statement in addition to the income calculation. Finally, a further use, widely employed by economists, and one in which accountants ought to develop an interest, is to reveal "distributive shares" in the output of a concern or an industry—how much "take-home pay," for example, does labor actually get, how much do the suppliers get, how much to creditors, stockholders, government, etc. Properly handled, a statement of funds is better adapted to the dissemination of this type of information than the conventional income statement with its highly abstract, sophisticated cost allocations and estimates, and its completely different orientation.

III

We now proceed to the more formal aspects of the topic. Foremost among the problems involved is that of a fairly precise definition of "funds." A definition is necessary not only to satisfy the niceties involved, but also to assist us in the preparation of the statement and in the resolution of new or difficult problems. A definition of funds provides this assistance by supplying a framework for the whole project, giving us a beginning and an ending balance into which the fund flows must fit or be reconciled, and thereby leading to a second "principle" by which to decide whether or not to include a financial event.

The conventional statement of funds, as it has appeared in published annual reports of the last ten or fifteen years, will serve as a starter. Simply on the basis of frequency of appearance, little doubt exists that "funds" in these reports are defined as identical with "net working capital," that is to say, the difference between current assets and current liabilities. This definition has the virtues of simplicity and of reliance on other widely-used concepts, namely, current assets and current liabilities. These virtues we will stress at the moment; its defects will be revealed later.

Certain consequences flow from the definition. First of all, it establishes the content of the statement of funds—the statement must explain the change, increase or decrease, in net working capital during the period under review. Secondly, and perhaps of more importance, it provides the basis for consistent and logical answers to any question that may arise with respect to the inclusion or exclusion of a financial event, because any external transaction that increased net working capital is, by definition, a "source" of funds, and any external transaction that decreased net working capital is, for the same reason, an "application" of funds.

For example, under this conventional

definition of funds, a stock dividend should not be reflected in a "funds" statement because a stock dividend does not involve any net working capital account in either its debit or its credit aspect. By contrast, a cash dividend, when declared, is an application of funds because it results in a credit to dividends payable or to cash, either of which reduces net working capital, and is therefore a part of the funds flow. Similarly, a dividend in kind, if it is payable in some current asset, also reduces net working capital and belongs in the funds statement; if, however, it is payable in a noncurrent asset (for example, the shares of stock of a subsidiary corporation) no working capital account is involved. As a consequence, that transaction is not logically a part of the funds flow.

The definition adopted also helps resolve questions with respect to amounts to be reflected and their classification, as well as with respect to the type of event to be included. Suppose, for example, that a substantial portion of plant is sold for cash at a loss. Ordinarily, the financial effect of this transaction will be reflected in the appropriate property accounts, their related depreciation allowances, and in an account reflecting the loss on sale of property. It may also involve offsets to income taxes. Two points seem clear enough, (1) the event provided funds, and (2) the amount to be reflected in a funds statement is the amount by which net working capital increased, in this case, the amount of cash received on the sale. But this amount is no longer reflected in a single account; therefore the bits and pieces of the transaction, as they are distributed through the property accounts, the depreciation allowances, the loss account, and possibly the related tax effects, should all be combined into one figure to show the increase in net working capital, the "source" of funds.

But the definition of funds as identical with working capital apparently possesses certain disadvantages. Symptomatic of these is the recent experimentation with "cash flow" statements in published annual reports. For example, United States Steel and American Phenolic have presented two funds statements, one of conventional type, consisting of a schedule of changes in working capital during the year, and the other purportedly showing the flow of cash in and out of the business. These two statements, as published in the 1952 report of American Phenolic Corporation, are appended as Exhibit "C."

A record of cash receipts and disbursements, with the receipts classified by origin (e.g., from customers, issues of capital stock, borrowings from banks, etc.) and the disbursements by object of expenditure (e.g., to suppliers of materials, employees, stockholders, bondholders, etc.), while useful in its own way and undoubtedly a form of "funds" statement probably is overly-narrow in its orientation. A better balance would be achieved if funds were defined somewhere between the narrow extreme of cash and the broad extreme of working capital; a useful middle point is the concept of "net money assets available for disposition." Concretely, this concept consists of the sum of cash on hand and in banks, marketable securities held as secondary cash reserves, and current receivables, less the current liabilities that will be paid by quick assets in the near future. In brief, funds become identified with cash on hand plus cash in process of collection minus checks in process of being written. Where bank financing is important, as in the American Phenolic case, bank loans can be excluded from the category of "funds" and treated as a source or application.

A comparison of the conventional definition of funds with the one proposed above will indicate that the only major dif-

ference between the two is the treatment of inventories. Under the conventional definition, inventories are included as a part of net working capital, the funds balance itself. In the proposed definition, inventories are treated as a source of funds, when they are sold to customers, and as an object for the application of funds when debts are incurred to move them from the materials stage through process and into finished goods. This latter treatment seems more in accord with the function of inventories in a going concern. Of course, when the "inventories" are in reality indistinguishable from receivables, they should be classed with the purely financial items. The reference here is to the output of a gold or silver mine or the work done on a cost-plus-fixed-fee (CPFF) contract.

Regardless of the definition of "funds" adopted, certain types of financial events that ought to be included will be omitted, unless the first principle previously enunciated is invoked. This first principle states that we are dealing with external transactions. The type of transaction that is likely to be left out, if attention is focussed too narrowly on the definition of funds, is the barter deal or the deferred-payment transaction. Take the case of a building acquired for 10 per cent cash and 90 per cent first-mortgage bonds. Whether funds are defined narrowly as cash, or less narrowly as "net disposable money assets," or broadly as net working capital, only the 10 per cent down-payment results literally and directly in a decrease (application) of funds. Still, the whole event is important, and, under the first principle, should be reflected by showing an application of the full amount of the purchase price of the building and a source of funds equal to the bonds accepted by the vendor. When the bonds are retired, the statement for that period should show an appropriate application of funds to retire long-term debt.

A rationale in the form of a presumed hypothetical intermediate cash transaction is theoretically satisfactory. Under this explanation, the event is treated as though the bonds were issued for cash, and the cash used to buy the building. But this type of explanation leaves the way open for other hypothetical interpretations which may not be so acceptable, and furthermore, is unnecessary. It is better, with any definition of funds, to refer back to our first principle, namely, that we are dealing with relationships between the concern and the outside world, and include these barter deals and deferred-payment arrangements explicitly, rather than by the back-door of hypothetical intermediate transactions.

Certain other characteristic problems arise in the preparation of a funds statement. Noncash gifts and subsidies, for example, have no impact on funds; yet the amount involved may be material and the reporting essential to a full disclosure of the way in which the enterprise is being financed. These gifts and subsidies should be included as (a) funds provided by the donor and (b) applied to the object received. Gifts or subsidies in the form of cash do increase funds, however defined, and will appear in a funds statement.

An example of this type of problem comes to mind. A hospital, newly-formed, acquired equipment for cash, and then was reimbursed for its actual expenditures by a governmental agency. In this form, no difficulty arose in the preparation of a funds statement—the hospital had clearly applied funds to acquire equipment; the hospital had clearly received funds from an outside source when it was reimbursed for its earlier outlays on equipment. But suppose the governmental agency had acquired the equipment itself and made the gift (subsidy) to the hospital in kind. No cash (or other fund account) would have been involved on the hospital's rec-

ords. Yet it seems clear that the two forms lead to identical results; the substance should prevail in the preparation of a funds statement as in the case of any other accounting report.

One additional observation may be useful. Notice that we are not concerned with the classification of a gift or a subsidy as an increase in capital or in earnings, or in neither. We are concerned solely with the fact that a financial event occurred involving the entity and an outsider; when we report that event, we have fulfilled the requirements of a funds statement. In the related but not identical problem of income measurement or the reporting of financial position, the question of the proper classification of a gift or subsidy as between capital and income will have to be faced. But not in a funds flow analysis. As a consequence, a funds statement will reflect the event in identical fashion, regardless of the manner in which it was reflected in the records—records which are conventionally designed primarily to assist in the determination of periodic income.

Another problem is the treatment of depreciation and other amortization. No extended analysis of this warhorse is necessary; instead a few observations will be made. First, the application of funds to the depreciable or amortizable item is reported in the period of its acquisition. Second, depreciation itself is omitted from the funds statement because it is a cost or expense, properly recognized in the measurement of income, which does not require the application of funds, however defined, in the current period. Third, any attempt to show depreciation as a "source" of funds is awkward, unnecessary, misleading, and just plain wrong. The reference here is to the widespread practice of adding back depreciation to the net profit figure to get the amount of funds provided by operations. This is a worksheet adjustment, and does not belong in a formal statement. The figure we are after, and that we usually get by this adjustment, is the amount of funds provided by operations *before* deducting a nonfund item such as depreciation expense. Fourth, the depreciation adjustment may be incomplete in a manufacturing concern—a considerable amount of depreciation may be tied up in inventories, and ought to be reversed.

Another problem is the tendency to want to reverse the entries for estimated uncollectible receivables. Except where funds are defined as cash, and the funds statement accordingly becomes a report of cash receipts and disbursements, this type of reversal is not warranted. Current receivables are a part of funds; the allowance for bad debts is an attempt to reflect those receivables on a net collectible basis, and should therefore be left alone in a funds analysis. Perhaps the difficulty arises when the analyst recognizes quite correctly that the charge to income for bad debts is not an application of funds. But the proper treatment in this instance is not to reverse the entry as a nonfund adjustment, similar to depreciation. Rather the charge to income should be interpreted as a revenue-deduction item, a correction of an otherwise overstated revenue account. If the bad debts debit is so interpreted, and it is the correct interpretation, no difficulty on this score will be encountered in the preparation of a funds statement.

A loss on the conversion of any funds item constitutes an outflow of funds, a diminution in the "pool" of homogeneous elements; as a consequence the loss would usually be classified as an "application" of funds. For example, assume that marketable securities, held as a secondary cash reserve, and reflected in the books at their cost of $100,000 are sold this period for $95,000. Assume also that in this same period a theft of $5,000 cash takes place, without recovery of any sort. Each loss

of $5,000 represents an "outflow" of funds, and should be so reported, even though the events themselves were unplanned and undesirable. The related case of a gain on the conversion of a funds item is clearly an inflow of funds, classified usually among the sources.

The treatment of inventories as a source of funds or an object of their application has already been urged primarily on the basis that inventories, in the usual case, are too important to be buried in a net working capital figure and require substantial outlays to move out to customers.[3] The sales figure is of course identical with the funds provided by customers during the period. The application of additional costs to process the inventory in the current period can be calculated in total by a simple formula, namely, the cost of goods sold plus the difference between the ending and the beginning inventories. In the case of the so-called actual cost systems, this formula will always hold regardless of the method of inventory pricing employed, whether cost or market, first-in, first-out, last-in, first-out, or average cost. The formula yields a total figure; it will not give the breakdown of the costs among labor, materials, supplies, etc.

In the case of a standard cost system, the formula just given will also hold, provided the variances are closed out at the end of the period to inventories and to cost of goods sold. If the variances are instead carried direct to income, the formula, as it stands, will calculate funds applied *at standard*, which is presumably not satisfactory in a funds analysis. Consequently, the formula should be expanded to include "plus or minus the standard cost variances."

As the last problem to be discussed, consider the situation when a previously noncurrent item becomes current, without an actual transaction with an outsider. Specifically, consider the case of the current portion of a serial bond issue. Each year a new series is detached from the long-term debt and placed among the current debts, indicating payment in the near future. In a funds statement, this amount is treated as an application for the same reason that a dividend declaration is so treated, namely, that payment in the normal course of events is automatic in the short-term. As a consequence, the pool of net disposable money-assets or of net working capital is diminished. In either case we have a clear case of an event giving rise to a decline in funds.

IV

In the process of preparing the funds statement, several methods are available. Vatter, of the University of Chicago, has proposed the derivation of data from direct posting to T-accounts.[4]

Others have stressed the desirability of inserting a summary analysis of nonfund accounts in audit working papers, thereby also obtaining directly the necessary data, as under Vatter's proposal, but without the intervention of actual accounts. This procedure is illustrated in Finney and Miller, *Principles of Accounting: Intermediate*, 4th Edition, and in Holmes and Meier, *Intermediate Accounting*, Revised Edition. The most widely-used method, however, is the process of adjusting changes derived from comparative balance sheets, as supplemented by an analysis of income and retained earnings.

[3] Where the finished goods or merchandise is virtually as good as cash the conventional inclusion of inventories in the funds total is satisfactory. In addition to inventories of precious metals and costs tied up in CPFF contracts, inventories of commodities for which a highly-organized spot and futures market exists would qualify for inclusion. The case for inclusion is especially strong if these types of inventories are stated at net realizable value instead of at cost, because cost does not, except by coincidence, measure the inflow of funds from the holding of highly-marketable inventories.

[4] Wm. J. Vatter, "A Direct Method for the Preparation of Funds Statements," *Journal of Accountancy*, June 1946, pp. 479–89; also see "Correspondence" in the September 1946 issue of the same *Journal*, pp. 256-57.

If this procedure is followed, certain technical problems arise which are similar regardless of the definition of funds employed. These may be summarized briefly as follows:

(1) Reverse the differences in account balances representing transactions not involving funds; (example: the depreciation entries)

(2) Reinstate any transactions involving funds that are suppressed in the usual accounting process; (example: sale of a noncurrent asset)

(3) Combine and reclassify the remaining items to bring the bits and pieces of funds data together.

In the worksheet itself, the funds analysis should be quite detailed in order to insure that no important aspect of the financial flow has been omitted, overlooked, or underestimated. But in the statement itself, as in any financial statement that we prepare, similar items should be judiciously combined and grouped, important aspects played up, and minor, inconsequential flows thrown into a "miscellaneous" or "all other" category. No one would disagree with the basic soundness of these commonsense rules of presentation of data. But a related problem lurks in the background on which there is no unanimity of opinion or of practice. The reference is to the extent to which similar sources and applications should be set off against each other. For example, all would agree that if X Company borrowed $1,000,000 from each of three different banks, we would meet all the niceties of disclosure and relevance if we reported a source of funds of $3,000,000 from bank borrowings; no one would insist that we ought to spell out the three separate borrowing operations. But suppose during the same period, X Company also paid off $1,500,000 of other bank loans. Should we now report a source of funds of $3,000,000 and an application of funds of $1,500,000 or should we be content with the disclosure of a net source of funds of $1,500,000 from bank borrowings?

Of more substance is the treatment of the funds flows generated by operations. Specifically, the reference is to the source of funds tapped by sales to customers and the applications of funds to wages, materials, etc. The reflection of a single source of funds from operations, calculated by adding nonfund charges to net profit, is found in most published analyses of changes in net working capital. But this practice may be omitting data on significant changes. Notice, for example, the difference in mode of treatment of the operating items in the American Phenolic data, attached. In the statement of changes in working capital, funds provided by operations are shown conventionally in two figures, net profit for the year, and provision for depreciation. In the statement of cash receipts and disbursements, however, the influence of operating items is reflected in one item, sales, under receipts, and in four items under disbursements (specifically, materials, supplies and services; salaries and wages; taxes; and interest). The recommendation here being urged is to set forth a funds statement more along the lines of American Phenolic's "cash flow" than along the lines of the same company's working capital analysis. Fundamentally, the point being made is that we should guard against unwarranted inferences as to causal relationships, particularly when an application of funds is subtracted from an important source of funds, and the difference only then set forth in a formal statement.

Part of the difficulty here stems from the fiction that the funds statement is an attempt to explain what became of the profit, and that accordingly the tie-in must be with the net income figure. But even a casual examination of published funds statements will reveal that (a) they

display sources and applications of funds beyond those connected with operations, and (b) they tie in with net working capital, or cash, or some other concept of funds, but not with net profit. No one can ever tell what became of net profit, a calculated magnitude, the difference between revenue and expense. We can tell a great deal however about the inflow of funds generated by sales, by borrowings, by issues of shares, and by other means, and the outflow of funds related to the services of employees, of suppliers, of lenders, of stockholders, etc. The influence of income-measurement is strong; it has obviously dictated the central position of the income statement. It has less obviously but nevertheless just as certainly dictated the form and content of the balance sheet. To judge by published statements, it has also influenced the form and content of the funds statement. But the proper function of a funds statement is not to tell us more about the income-generating and income-measuring processes, but rather to disclose data on the related but nevertheless distinct task of financial management of the enterprise.

Exhibit A

Financial Circulation—
A Classification

Funds are derived from
1. Contributions of stockholders;
2. Long-term loans, e.g., mortgages, bonds, equipment contracts;
3. Short-term loans supplied primarily by commercial banks;
4. Sales to customers. This class includes reduction of inventories;
4(a). Government subventions not included in (4), above, such as subsidies to airlines, steamship companies, etc.;
5. Disposal of noncurrent investments;
6. Disposal of plant, property, and equipment;
7. All other sources, e.g., gifts.

Funds are used to
1. Cover dividends and redeem shares of stock;
2. Services and retire long-term debt;
3. Service and pay short-term loans;
4. Cover operating costs, such as labor, materials, supplies, etc. This class includes increase of inventories;
4(a). Pay taxes not included in (4), above;
5. Acquire noncurrent investments;
6. Acquire plant, property, and equipment;
7. Cover all other applications, e.g., loss by embezzlement.

Exhibit B

X COMPANY
FUNDS STATEMENT
For Period from _____ *to* _____

Funds, beginning of period			xxx, xxx
	Sources	*Applications*	
Fund changes during the period:			
I. Net funds from operations (profit or loss as adjusted for non-fund items)—See Note	xxxx		
II. Funds transactions with stockholders			
Dividends paid		xxxx	
Investments	xxxxx		
III. Funds transactions with long-term creditors			
Sale of bonds	xxxx		
Retirement of bonds		xxxxx	
IV. Funds transactions, involving plant and inventories, etc.			
Plant, intangibles, and investments		xxxx	
Decrease in inventories	xxxxx		
Totals	xxxxx	xxxxxx	
Net increase (decrease) in funds (See Schedule A) [Not reproduced]			xxx, xxx
Funds, end of period			xxx, xxx

Adapted from Hector Anton, *op. cit.*, p. 107.

NOTE: Anton concludes that, on balance, a reflection of net funds from operations fits in most closely with current practice and its apparent objectives. My own preference is for more detail, at least to the extent of revealing sales and the major operating costs. But in either case, the classification and form illustrated above will serve the purpose.

Exhibit C

AMERICAN PHENOLIC CORPORATION
Statement of Changes in Working Capital

	Year Ended December 31 1952	1951
Working Capital—Beginning of Period	$ 2,904,385	$ 3,845,476
Funds Provided—		
Net profit for year	$ 1,279,290	$ 941,868
Provision for depreciation	541,786	367,411
Proceeds from sale of fifteen year 4¼% sinking fund notes	2,000,000	—
Sundry, net	201,879	50,971
Total funds provided	$ 4,022,955	$ 1,360,250
Funds Applied—		
Additions to plant and equipment	$ 1,050,481	$ 1,673,326
Provision for sinking fund including payment of long-term loans	969,049	232,950
Dividends declared	380,532	320,016
Increase in prepaid expenses	21,326	75,049
Total funds applied	$ 2,421,388	$ 2,301,341
Net increase or decrease in working capital	$ 1,601,567	$ 941,091
Working Capital—End of Period	$ 4,505,952	$ 2,904,385

AMERICAN PHENOLIC CORPORATION
Statement of Cash Receipts and Disbursements

	Year Ended December 31 1952	1951
Cash Balance—Beginning of Period	$ 1,295,109	$ 800,424
Receipts—		
Sale of merchandise to customers	$36,456,101	$24,355,836
Bank loans, including $3,200,000 "V" loan	—	3,950,000
Sale of U. S. Government securities	—	1,185,315
Refund of prior year's Federal income taxes and renegotiation	—	45,261
Long-term 4¼% loan	2,000,000	—
Sundry	101,575	110,941
Total receipts	$38,557,676	$29,647,353
Disbursements—		
Materials, supplies and services	$21,229,937	$19,106,502
Salaries and wages	8,312,128	6,572,904
Taxes, including purchase of U. S. Treasury tax savings notes	4,195,700	1,205,563
Plant and equipment	1,050,481	1,673,326
Dividends	360,408	320,000
Retirement of bank loans and "V" loans	1,450,000	—
Debentures purchased, including deposits with Trustee for retirement of long-term loans	978,825	170,411
Interest	254,733	103,962
Total disbursements	$37,832,212	$29,152,668
Net increase in cash balance	$ 725,464	$ 494,685
Cash Balance—End of Period	$ 2,020,573	$ 1,295,109

ASSOCIATE MEMBERSHIPS

FOR THE INFORMATION of teaching members of the American Accounting Association, the numbers of new Associate Memberships are reported by schools. These include all applications processed by our Secretary's Office during the period of August 17, 1955 through April 13, 1956.

Over 200 members

University of Miami (245)

100–200 members

City College of New York (159)
New York University (106)
University of Georgia (108)
University of Illinois (107)

50–100 members

John Carrol University (61)
Lehigh University (72)
McGill University (71)
Michigan State University (71)
Ohio State University (52)
University of California, Los Angeles (80)
University of Colorado (66)
University of Iowa (72)
University of Pennsylvania (69)
University of Texas (86)

40–50 members

Brigham Young University
Burdett College
Husson College
New York State Agricultural and Technical Institute
University of Detroit
University of Massachusetts
University of Minnesota
University of Tennessee
Wayne University

30–40 members

Louisiana Polytechnic Institute
Rutgers University
University of Alabama
University of California
University of Michigan
University of Pittsburgh
University of Washington

20–30 members

Akron University
Bowling Green State University
Canisius College
De Paul University
George Washington University
Iona College
Kansas State Teachers College
LaSalle Extension University
Miami University (Ohio)
Northwestern University
Pace College
Quinnipiac
Rider College
Sacramento State College
San Jose State College
Stetson University
Temple University
University of Buffalo
University of Florida
University of North Dakota
University of Southern California
University of Wisconsin
Western Reserve University

10–20 members

Arizona State College
Assumption College
Bob Jones University
Boston University
Brooklyn College
Brooklyn University
Catawba College
Central Missouri State College
Duke University
Elon College
Fairfield University
Harding College
Howard University
Indiana University
Jersey City Junior College
Johns Hopkins University
Laredo Junior College
LaSalle College
Loyola University
Marquette University
Mount St. Mary's College
Multnomah Junior College
Nebraska State Teachers College
Niagara University
Northeast Louisiana State College
Northeastern University
Oklahoma University
Pennsylvania State University
Pierce School of Business Administration
Portland State College
Rockhurst College
Roosevelt College
San Diego State College
Southern Illinois University
Southern Methodist University
Strayer College
Texas A & M College
Texas Technological College
University of Arizona
University of Arkansas
University of Denver
University of Kansas City
University of Mississippi
University of Nebraska
University of Omaha
University of Portland
University of Puerto Rico
University of Rochester
University of Tulsa
University of Utah
University of Wyoming
Villanova University
Virginia State College
Walton School of Commerce
Washington University (St. Louis)
Weatherford College
Westminster College
Wright Junior College

5–10 members

A & T College of North Carolina
American University
Anderson College
Arizona School of Business Administration
Baltimore College of Commerce
Becker Junior College
Bloomsburg State Teachers College
Bradley University
Bridgewater College
California College of Commerce
Canal Zone Junior College
Casper College
Central Michigan College
College of Steubenville
Columbia University
Cornell University
Creighton University
Davis Business College
Drexel Institute of Technology
Farleigh Dickenson College
Florida State University
General Motors Institute
Georgetown College
Georgia State College
Golden Gate College
Gonzaga University
Harper College
Hastings College
Heald Business College
International Accountants' Society
King's College
Laval College
Lewis College
Long Island University
Los Angeles State College
Louisiana State University
Macalester College
Marshall College
Massachusetts Institute of Technology
Michigan State Normal College
Misericordia College
Morningside College
Morton Junior College
North Texas State College
Notre Dame University
Ohio University
Ohio Wesleyan University
Pan American College
Regis College
Rice Institute
Rutherford
St. John Fisher
St. Vincent College
San Bernardino Valley College
San Francisco State College
Southern University
Spencerian College
Stanford University
Syracuse University
Tennessee Polytechnic Institute
University of Baltimore
University of Chicago
University of Cincinnati
University of Dayton
University of the East, P.I.
University of Kansas
University of Kentucky
University of Maryland
University of Missouri
University of North Carolina
University of Rhode Island
University of Richmond
University of San Francisco
University of Santa Clara
University of Virginia
Upsala College
Wake Forest College
Washington State College
Westchester Community College
Wichita University

Less than 5 members

Abilene Christian College
Adelphi College
Alabama State Teachers College
Alabama Polytechnic Institute
Allegheny College
Alliance College
American Institute for Foreign Trade
Arkansas Polytechnic College
Armstrong College
Army Audit Agency
Ashland College
Augustana College
Austin Peay State College
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Ball State Teachers College
Baylor University
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Benjamin Franklin University
Bentley School of Finance
Berry College
Bliss College
Bryant College
Bucknell University
Burlington Junior College
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Cades CPA Coaching School
California State Polytechnic College
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Centenary College of Louisiana
Claremont Men's College
College of St. Thomas
College of Sequoias
Colorado College
Crane Junior College
Dallas College
David Lipscomb College
Dearborn Junior College
Detroit Institute of Technology
Drake Community College
Drake University
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Ely Junior College
Emory & Henry College
Erskine College
Evansville College
Fairmont State College
Florida Southern University
Fort Lewis A & M College
Franklin and Marshall College
Furman University
Gannon College
Graceland College
Grove City College
Hardin-Simmons University
Hartwick College
Harvard University
Henderson County Junior College
Henry Ford Community College
High Point College
Hofstra College
Idaho State College
Illinois Institute of Technology
Immaculate Conception Seminary
Institute of Chartered Accountants of Ontario
Institute Tech. de Est. sup. Monterrey
International Correspondence School
Iowa State College
Iowa State Teachers College
Jacksonville State College
Kansas Wesleyan University
Kansas State College
Kent College of Law
Knoxville Business College
Lake Forest College
Lamar State College of Technology
LaSalle-Peru-Oglesby Junior College
Lawrence Institute of Technology
Long Beach State College
Los Angeles City College
Los Angeles Harbor Junior College
Luther College
Manchester College
McCoy College
McIntosh College
Memphis College of Accounting
Meridian Junior College
Midwest Institute
Minnesota State Teachers College
Mississippi State College
Montana State University
Moravian College
Morehouse College
Napa Junior College
New England School of Accounting
New Mexico Western College
Norman College
Northern Illinois College
North Georgia College
North Park Junior College
Northwestern State College
Oklahoma A & M College
Pacific Lutheran College
Pennsylvania Military College
Pierce Junior College
Reid CPA Coaching
Robinson Business College
Robert Morris School

Russell Sage
St. Ambrose College
St. Benedict's
St. Cloud State Teachers College
St. Edwards University
St. Johns University
St. Joseph's Teachers College
St. Louis University
St. Mary's University
St. Olaf College
St. Petersburg Junior College
Savannah State College
Seton Hall University
Siena College
Sinclair College
Sir George Williams College
South Bend College
Southeastern University
Southeastern Louisiana College
Southern State College
Southwest Missouri State College
Southwestern Louisiana Institute
Spring Hill College
Stephen F. Austin State Teachers College
Suffolk University
Texas Southern
Texas Western College
Thiel College
Tulane University
University of Corpus Christi
University of Delaware
University of Hawaii
University of Houston
University of Idaho
University of Nevada
University of New Mexico
University of Oregon
University of Redlands
University of Saskatchewan
University of Scranton
University of South Carolina
University of Toledo
University of Western Ontario
U. S. Air Force
U. S. Armed Forces Institute
U. S. Department of Agriculture
Union College
Upper Iowa University
Ventura College
Vincennes University
Virginia Polytechnic Institute
Virginia Union University
Walla Walla College
Wenatchee Valley College
West Virginia University
West Virginia State College
Western Carolina College
Western Michigan College
Western New England College
Wheaton College
William & Mary College
Winona State Teachers College
Wittenberg College
Wofford College
Woodbury College
Wyoming College
Xavier University
Yakima Valley Junior College
Y.M.C.A. Institute

ORIGIN OF THE TRIAL BALANCE*

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DOUBLE-ENTRY bookkeeping and its procedures found its inception in the spectacular expansion of commerce that occurred in Italy after the Crusades. The inadequacy of the crude record-keeping procedures in use at that time, made it imperative to devise more efficient methods of bookkeeping to record the increasing flow of complex transactions of a fast growing foreign trade. From this mammoth growth of business, double-entry gradually evolved. It is fairly well established that it originated and developed in Italy during the thirteenth and fourteenth centuries, though the exact time, manner, and locality are a matter of conjecture. Paucity of merchants' records, which have survived of this early period, is the reason for this uncertainty.[1]

Because of this lack of basic business data, scholars have turned to the study of the works of the early writers on double-entry bookkeeping. The first known work of importance to appear was Paciolo's *Summa*,[2] published in 1494, in which he includes a treatise on the double-entry system then current at Venice. This, however, was the end of the fifteenth century. Double-entry had already been in use for a long time. The earliest known double-entry records, fragmentary though they be, are the *Massari Ledgers* of 1340[3] of the Commune of Genoa, which date a century and a half earlier. Paciolo's *Summa*, because of its late appearance, yields very little light on the origins of double-entry procedures. The system he describes is a mature system, fully developed and thoroughly tested by the exigencies of trade.

The ambiguity of terminology, in the works of the early writers on bookkeeping, has caused confusion among recent writers about the nature of some of the recording procedures and the manner in which they were applied. The trial balance is one such procedure. Lack of clearness in Paciolo's text is responsible for the belief that both the "bilancio del libro" (balance of the ledger), and the "summa summarium" (sum of sums), as described by Paciolo, were trial balances and that the two terms refer to the same bookkeeping procedure. But this is not so. They refer to two separate and distinct procedures. To clear the issue, both procedures will be described and traced through the writings of the principal authors of the fifteenth and sixteenth centuries.

The "bilancio del libro," as explained by Paciolo, concerns the basic characteristic of duality of entries in the ledger, kept on a double-entry basis, and the check of this duality of entries by a trial balance. In Chapter fourteen of his *Summa*, Paciolo clearly delineates the need to maintain the duality of entries when he says: " . . . and therefore never must an amount

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[1] E. Peragallo, *Origin and Evolution of Double-Entry Bookkeeping* (1938), p. 1.

[2] Fra Luca Paciolo, *Summa de Arithmetica Geometria Proportioni et Proportionalita. Distinctio Nona-Tractatus XI, Particularis de computis et scripturis* (Venice, 1494).

[3] Raymond De Roover says that additional original sources have recently been uncovered in Florence which, if they prove to be double-entry would date the earliest known double-entry records to at least 1296 instead of the 1340 of the "Massari Ledgers." "New Perspectives on the History of Accounting," THE ACCOUNTING REVIEW, July 1955.

be entered in credit which is not also entered in the same amount in debit."[4]

The duality of entries of the ledger thus established, Paciolo then turns his attention to the trial balance as a check on the equality of the debits and credits. In chapter thirty-six, he says: "The (trial) balance of the ledger is understood to be a sheet of paper creased lengthwise on the right hand of which are copied the credits of the ledger and on the left hand the debits; and check if the sum of the debits is the same as that of the credits, and if that is so the ledger is correct.[5] The same point is made, but less succinctly, in chapter fourteen.

Despite previous statements of the writer to the contrary,[6] it is obvious that Paciolo was fully aware of the true construction and function of the trial balance. Yamey correctly stated this, but unfortunately referred to Manzoni's "summa delle summe" as a proper trial balance.[7] Hatfield also made the same mistake when he identified Paciolo's "summa summarium" as a trial balance.[8]

Paciolo uses his "summa summarium," literally the "sum of sums," as a final proof of the closing of a ledger, whose balances are transferred to a new ledger. He explains this closing procedure at some length. In chapter thirty-two he begins by saying: " . . . now one must state the method of transferring one ledger to another, when one wants to change ledger because it is full, or because of a new year, the latter being customary to do in famous places, where leading merchants observe the practice every year. And this act together with the following is called the 'balancing of the ledger' (bilancio del libro)."[9] This latter, incidentally, illustrates another use of the term "balancio del libro." The variety of meanings which Paciolo attached to this term is probably the reason for some of the confusion that occurred.

In chapter thirty-four of his *Summa*, Paciolo gives a detailed exposition of the ledger-closing procedure. He begins with the closing of accounts which are to be transferred direct from the "Cross" ledger to the "A" ledger,[10] such as cash, capital, merchandise, fixtures, establishments, debtors, creditors, etc. But, says Paciolo, there are certain accounts which one may not wish to transfer to the new ledger, such as expenses and income. These accounts are of a private nature and should therefore be closed into the profit-and-loss account, the latter in turn being closed into the capital account. The capital account, following the similar treatment of the asset and liability accounts, is then closed and its balance transferred to the new ledger. This is usually the last entry, which finally closes the old ledger.[11]

[4] Paciolo, *op. cit.*, chapter 34. " . . . e cosí mai si deve mettere cosa in avere che ancora quella medesima con suo ammontare non si metta in dare."

[5] *Ibid.*, chapter 36. "Il Bilancio del Libro s'intende un foglio piegato per lo lungo sul quale dalla mano destra si copiano i creditori del Libro e dalla sinistra i debitori; e vedi se la somma del dare é quanto quella dell'avere, e allora il Libro sta bene."

[6] Peragallo, *op. cit.*, p. 64. "Origin of the Trial Balance," *Journal of Accountancy*, Nov. 1941, p. 448.

[7] Basil S. Yamey, *The Functional Development of Double-Entry Bookkeeping*, Accounting Research Association, Bulletin No. 7, 1940, p. 22.

[8] Henry Rand Hatfield, "Neither Pietra nor Flori," *Journal of Accountancy*, Feb. 1943, p. 165.

[9] Paciolo, *op. cit.*, chapter 32. " . . . bisogna ora dar modo al riporto di un Libro in altro, quando volessi mutar Libro per cagion che fosse pieno, ovvero per ordine annuale di millesimo, come il piú si costuma fare per luoghi famosi, che ogni anno, massime a millesimi nuovi, i gran mercatanti sempre lo osservano. E questo atto insieme con li seguenti é ditto *Bilancio del Libro.*"

[10] It was the practice in early double-entry bookkeeping to distinguish the ledgers of succeeding periods with letters, the first one beginning with +, the next with "A," and the rest following alphabetically.

[11] Paciolo, *op. cit.*, chapter 34. "E cosí anderai saldando tutte le partite nel Libro croci, che tu intendi portare in Quaderno A, di Cassa, Cavedal, robe, mobili, stabili, debitori, creditori, uffici, sensarie, pesadori di comune, ecc. coi quali si usa alle volte andare a conto lungo. Ma quelle partite che non volessi portare in ditto Quaderno A (che potrieno essere quelle che solo a te s'appartengono, e non sei obbligato a segnare conto ad alcuno, come son spese di mercanzia, spese di casa, entrata, uscita e tutte spese straordinarie, fitti, pensioni, feudi o livelli . . .) queste simili convengonsi saldare nel medesimo Libro croci nella partita del Prò et

At this point Paciolo introduces his "summa summarium." He says: "and in this manner," as set out in the preceding paragraph, "is closed all of the first ledger with its journal and memorandum book. And so that this will be clearer, the following additional check of the ledger-closing will be made: That is, add all the debit entries (of each account) of the Cross ledger (the old closed ledger) and place them on the left hand side of a sheet of paper, and add all the credit entries (of each account) and place them on the right hand side; and now add these other sums and the total sum of all the debits will be called 'summa summarium,' and the same will be done of all the credits which total will also be called 'summa summarium'; . . . Now if these two 'summe summarium' are equal . . . it will be reasoned that the ledger was well managed, kept and closed . . . but if one of the two 'summe summarium' is larger than the other then that would denote an error in the ledger."[12]

At first this may appear to be a trial balance, but a closer examination will disclose that this is not the case. Paciolo makes the "summa summarium" after the balances of all open accounts, with the exception of the nominal accounts, have been transferred direct to the new ledger, without first routing them through the capital account or any formal balance account. After this the old ledger is bound to balance in all cases, even if it had been full of errors, because the two sides of each account have been made equal by inserting its balance to transfer to the new ledger. A trial balance of a closed ledger is no trial balance at all.

This obviously means that Paciolo used his "summa summarium" to serve exactly the purpose he intended, which is to prove the correctness of the closing of the ledger, and not for the purpose of a trial balance in the modern sense. If one takes a supposedly closed ledger and adds up all the debits on the one hand and all the credits on the other and there should happen to be among these an account not yet closed, it is obvious the two totals will not equal. Naturally, this will indicate that the ledger is not completely closed. This is exactly what Paciolo wanted to find out with his "summa summarium." It is the last step in his ledger-closing procedure, and it is not in any sense a trial balance as we understand it.

Paciolo, however, was also aware of the use of the trial balance as a guide for the transferring of accounts from one ledger to another. In the last few paragraphs of his last chapter, he says: "If the ledger is filled or old, and you want to transfer its accounts to a new ledger, proceed as follows: . . . take off the trial balance (bilancio del libro) of the old ledger and be certain that it is correct and equal, as it necessarily must be, and from this trial balance copy all the credits and the debits into the new ledger, all in the order they appear in the trial balance, leaving sufficient space between each account as you think will be needed. . . . In this manner the old ledger is transferred to the new ledger. Now in order to cancel the old ledger it

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Danno. . . . E così tutte le avrai saldate in questa del Prò et Danno, dove subito poi, somando sua dare e avere, potrai conoscere tuo guadagno e perdita. . . . E veduto che avrai per questo l'utile e danno tuo seguito, allora questo salderai nella partita del Cavedale, dove nel principio del tuo maneggio ponesti lo inventario di tutta la tua facoltà. . . . "

[12] *Ibid.*, chapter 34. "E così sia saldo tutto il primo Quaderno con suo giornale e Memoriale. E acciò sia più chiaro, di ditto saldo farai questo altro scontro: cioè sommerai in un foglio tutto il dare del Quaderno croci e ponlo a man sinistra, e sommerai tutto suo avere e ponlo a man destra; e poi queste altre somme risommerai e farane di tutte quelle del dare una somma che si chiamerà *summa summarium*, e così farai una somma di tutte quelle dell'avere che si chiamerà ancor lei una *summa summarium;* ma la *1a* sarà *summa summarium* del dare, e la *2a* si chiama *summa summarium* dell'avere. Ora se queste due *summe summarium* saranno pari, cioè che tanto sia l'una quanto l'altra uguali, quella del dare e quella dell'avere, arguirai il tuo Quaderno essere ben guidato, tenuto e saldato, per la cagione che di sopra nel capo 14 fu ditto; ma se l'una di ditte *summe summarium* avanzasse l'altra dinoterebbe errore nel tuo Quaderno." (Brackets added.)

would be wise to close each open account using the trial balance as a guide, that is, if an open account in the old ledger is a credit, as you will notice in the trial balance, debit it saying: 'the credit balance of this account is entered as a credit in the new ledger on page . . . '. And in this manner you will have closed the old ledger and opened the new ledger."[13]

In effect, Paciolo uses the trial balance, in this instance, as a balance account, the only difference being that it was not included as an account in the old ledger, but was drawn up as a separate statement outside of the ledger. It should be observed, however, that in practice, bookkeepers were already using the balance account as an account in the ledger for a good many years before Paciolo. Andrea Barbarigo, a Venetian merchant, used such an account in his records of 1434.[14] Apparently both procedures were in use at that time.

It may be of interest to note that the type of "bilancio del libro" we are considering is also a post-closing trial balance, because it is drawn up after the nominal accounts have been closed into the capital account. Furthermore, it should also be noted that in the ledger-closing procedure described by Paciolo, the trial balance (bilancio del libro) is drawn up first before the transferring of the accounts, whereas the "summa summarium" is prepared from the accounts of the old ledger only after they have been closed and their balances transferred to a new ledger. This should be convincing proof that Paciolo was describing two separate procedures when he was writing about the "bilancio del libro" and the "summa summarium."

It is, therefore, evident that Paciolo fully understood the trial balance and its uses as a check on the equality of the debits and credits and as a guide for the transferring of accounts from one ledger to another. It is also evident that the trial balance was fully known and in general use at the end of the fifteenth century, since Paciolo himself says that he is merely describing the Venetian method of bookkeeping, "which among all others it is certainly the best."[15] What is not so clear is whether use was made of Paciolo's "summa summarium" in the bookkeeping of the day. Whereas the trial balance remained an accepted bookkeeping procedure, the "summa summarium," as it had originally been conceived, seems to have had a short existence.

Manzoni, who published his *Quaderno Doppio* in 1540,[16] continued to use it. His work is important because of the set of double-entry books which accompany his text, the latter being nothing more than a copy of Paciolo's with minor changes. This should not be surprising, considering that plagiarism was a common practice until recent times.

A study of his double-entry books shows that Manzoni clearly understood the basic characteristic of duality of entries. However, one looks in vain for a trial balance. Curiously, he correctly describes it in his text, but since it is taken verbatim from Paciolo, it is to be wondered if he really understood it. Furthermore, in chapter

[13] *Ibid.*, chapter 36. "Quando il Libro fosse tutto pieno o vecchio, e tu volessi ridurlo a uno altro Libro nuovo, fa così: . . . E di poi levare il Bilancio del Libro vecchio che sia giusto e pari, come debbe essere, e da quello Bilancio copiare tutti i creditori e debitori in sul Libro nuovo, tutti per ordine come elli stanno in sul Bilancio, e fare i debitori e creditori ciascuno da per sè e lascia tanto spazio quanto tu arbitri avere a travagliare con seco. . . . E così è ridotto al Libro nouvo. Ora per cancellare il Libro vecchio ti conviene a ciascun conto acceso, ispengnerlo con lo Bilancio sopra ditto, cioè se uno conto del Libro vecchio sarà creditore, che lo vederai per lo Bilancio, faralo debitore, e dirai: per tanti resta avere a questo conto posto debbe avere al Libro nuovo segnato B a carte. . . . E così avrai spento tutto il Libro vecchio e acceso il Libro nuovo."

[14] Fabio Besta, *La ragioneria* (Milano 1929), vol. 3, p. 308.

[15] Paciolo, *op. cit.*, chapter I. "E servaremo in esso il modo di Vinegia, quale certamente fra gli altri è molto da commendare e mediante quello in ogni altro si possa guidare."

[16] Domenico Manzoni, *Quaderno Doppio col suo Giornale, secondo il costume di Venezia.* (Venice 1540).

four, where he describes the trial balance (bilancio del libro), he refers the reader to his "summa delle summe" in his worked example as an illustration of it. This is nothing more than Paciolo's "summa summarium," the last test of a closed ledger, worked out exactly according to Pacciolo's instructions. It is not a trial balance at all.[17]

It seems rather odd, that having understood the basic characteristic of duality of entries, that Manzoni should not have fathomed the true nature of a trial balance. But that seems to be the case. Nowhere in his set of double-entry books does he have a trial balance.

Three years later in England, Oldcastle[18] (as reprinted by John Mellis in 1588) correctly reiterates the description of a trial balance. He says in chapter XXV: "The ballance of your booke is to be understoode, a leafe of paper disposed and made in length and cressed in the middes, in such wise that it haue two faces in plaine sighte, uppon which leafe on the right side, yee shal copy al the Creditors, with the restes according to your Leager, and uppon the left side the Debitors, with their rests according. That don, beholde if that the summe of the Debitor, be as much as is the summe of the Creditor, and yf the summes of money, of Debitor and Creditor bee like, than is your ballance well, and appeareth evidently, that your bookes haue been orderly kept & gouerned." Manifestly, Oldcastle, as Manzoni did before him, based his work on Paciolo's or some version of it. This is an eloquent testimony to the wide appeal of double-entry bookkeeping and of its spread throughout Europe in the wake of trade.

In the same year (1543) Ympyn published his noteworthy *Nieuwe Instructie* in Antwerp. It was immediately translated into French in 1543, with the distinction of being the first book on double-entry to be published in that country, and was also rendered into English in 1547. As in the case of Oldcastle, Ympyn correctly describes the trial balance. In chapter XXV, of the English version, he writes: "And this ballaunce shall ye make in suche maner as the exemplary shall shew you, where ye shall finde all parcelles brought together as it wer on an heape in one shete of peper, that is to saie, al that is owyng on the one side, and al that is to discharge it withal on the other side. When ye haue doen this, then shall ye note in a paper the somes on bothe sides, and if the somes come bothe a like, then is there none error or faute committed in your boke, which seldome happeneth. . . ."

Ympyn, however, is the first author to use the balance account proper as an account in the ledger. An example appears in his set of books, which accompany the text. The procedure he uses is simple and direct. He first of all transfers the balances of the various merchandise accounts to a "remaining goods" account. He then transfers all the nominal accounts to the profit-and-loss account, the latter then being closed into the capital account. He finally transfers all the remaining open accounts to the balance account, thus closing the ledger. The sum of the debits and the sum of the credits of the balance account are each labeled "somma sommarum." Thus, Paciolo's old "summa summarium" is now, quite logically, identified with the balance account. The former originally was devised to test the accuracy of the ledger-closing and since the balance account does that much better and in addi-

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[17] Peragallo, *op. cit.*, p. 64. An extract of a "summa delle summe" from Manzoni's worked example is reproduced on page 64. This shows that every entry has debit and credit equal, and the same account title (e.g. cash) often appears more than once, as balances have been carried forward from one page to another in the ledger.

[18] Hugh Oldcastle, *A briefe instruction and maner how to keepe bookes of accompts after the order of Debitor and Creditor. . . . By the three books named the Memoriall, Journal and Leager.* (London, 1543).

tion closes the ledger, it is only natural that it should supplant the old procedure and take its name. Casanova in 1558,[19] Pietra in 1586,[20] and all future writers, use the balance account as the generally accepted procedure. Paciolo's awkward "summa summarium" is no longer used.

In conclusion it may be recapitulated that Paciolo, as the first author of importance on bookkeeping, did know the true function and construction of the trial balance. His "summa summarium," which has been mistaken for a trial balance, is nothing more than a device to test the ledger closing and it eventually gave way to the more efficient balance account. Why Paciolo did not use the balance *account* is not clear, since it was in current use at the time he wrote. Moreover, the manner in which he employs the trial balance in transferring accounts from one ledger to another, strongly suggests that he was aware of its existence.

It is obvious that the bookkeeping procedures described by Paciolo did not originate with him. The accounting literature of the period was more intent on setting forth the bookkeeping practices of the day than in formulating theories or creating new procedures. The origin of the trial balance, therefore, is to be found only in the actual business practices of the period. This, however, is difficult to establish, because, as previously mentioned, few bookkeeping records of the period have survived, and many of the survivals are incomplete.

[19] Alvise Casanova, *Specchio Lucidissimo* . . . (Venice, 1558). Casanova is also the first author to introduce the "opening balance account" in starting a new ledger (Peragallo, *op. cit.*, p. 69).

[20] Angelo Pietra, *Indrisso degli Economi* (Mantua 1586).

TRADITION AND ACCOUNTING

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IN SPITE OF THE OBVIOUS PROGRESS in bookkeeping methodology and refinements in accounting concepts in recent years, accountants of the mid-twentieth century are beset with numerous criticisms of existing practices and with unsolved problems of considerable magnitude. Current accounting literature certainly does not suffer from a lack of ideas and suggestions for improvement and expansion of accounting influence. A rather natural by-product of new ideas and suggestions is the criticism that present methods and concepts are unsuitable under existing circumstances.

Even a casual reference to current accounting writings leads one to recognize that many present-day critics, including men of respect both inside and outside the profession, feel accounting development has been retarded because of continued adherence to old ideas and concepts. Accounting is considered by some to be steeped in traditions. These traditions, the critics seem to imply, must be thrown aside if accounting is to meet the challenge of the times. Traditions are old ideas, used to solve old problems. As such, the critics point out, they constitute an impediment to progress as long as they continue to form the basis for decisions in a dynamic business world.

To one who has been conditioned to respect the past, to look to the past for clues to the solution of present problems, the arguments of these critics present a real dilemma: Is accounting hidebound with tradition? Is tradition in reality detrimental to advancement? Is reference to the past an unsuitable means of gaining insight into current problems? Or, is one to discount these writings of respected accountants who are critical of the existing methodology? A closer look at the nature of tradition and the relationship of tradition and accounting may help to form the basis for judging the real significance of these criticisms of accounting traditions.

WHAT IS A TRADITION?

A tradition is a belief, an action, a behavior pattern, or an attitude which finds justification in the present largely because of its general acceptability in the past. The tradition may well have had a sound basis for use in the past. On the other hand, the tradition may not have been justifiable even in the period of its early usage and growth. The fact of importance, however, is not the justification of the tradition in the past, but the continued usage from the past down to the present. A belief, action, idea, or attitude assumes an aura of tradition gradually through a period of continued usage and application. While the basis for the usage and application may be sound or unsound, continued usage itself is of prime importance in the emergence of a tradition.

From this description it is evident that tradition in general may have a logical justification. In accounting, an example of a logical tradition may be the cost basis for recording the results of business transactions. On the other hand, some traditions may be weak logically, as, for example, the lower of cost or market inventory method. Thus, the point of distinction between ideas, actions, or practices which are traditions and those which are not rests solely on the fact of past usage. A tradition, then, is an old idea, good or bad, which by some means came into usage, gained general acceptability,

and presently is still of importance in day-to-day activities and decisions.

Traditions exert varying degrees of influence in the several fields of knowledge. In some areas traditional ideas are heavily relied upon in meeting new situations. Reliance flows from the fact that the idea or practice has been widely used and accepted in the past. In other areas reliance on the past flows from a knowledge that what has been proved in the past could well be proved again in the present. Here old ideas may be important, but tradition is really of little significance. There is little reliance on old ideas because of their antiquity.

For example, in a truly scientific field such as chemistry, physics, or the natural sciences in general, the approach to knowledge and advancement relies heavily on previously established laws, formulas, and processes. The scientist attacks each new problem with a relatively open mind, being fully aware, however, that he could prove conclusively the acceptability of that which he relies upon from the past. Here tradition is not of much significance, as the approach implies the absence of any influences which are not presently justifiable. Nothing is accepted as authoritative except that which is capable of being proved in the present. Each present idea, action, or concept can be subjected to various objective tests to measure its validity. Past usage and acceptability are not deemed to be authoritative in a field of knowledge which is wholly adaptable to objective research, independent testing, or empirical studies.

The field of accounting, however, is not wholly scientific in nature. The possibilities of empirical studies and objective research are far more limited in accounting than they are in such areas as chemistry, physics, or the biological sciences. In addition, the field of accounting is somewhat unusual in that the validity or credibility of various ideas and actions available to solve a problem cannot be proved conclusively to be good or bad, right or wrong. These peculiar characteristics suggest the possibility that in accounting, traditions may exercise considerable influence in problem-solving decisions.

TRADITION AND GENERAL ACCEPTABILITY OF ACCOUNTING

Probably the best test of validity or credibility of an accounting practice or principle lies in its so-called "general acceptability." The status of general acceptability may be attained by two main approaches: (1) pronouncements of the American Institute of Accountants and the American Accounting Association, and (2) a history of long usage in the past. Even in the pronouncements of professional bodies it is quite probable that usage and acceptability in the past are of great significance in arriving at the final wording of a report or bulletin. Reliance on a test of general acceptability in most cases, then, carries with it some implication of applicability and usage in the past.

The high degree of importance attached to "general acceptance" has encouraged the development of accounting traditions. As given accounting ideas gain wider usage and acceptability, based on their obvious merits and utility, the ideas gradually approach the status of general acceptability. When these ideas are eventually recognized by accountants generally, or by the professional bodies in particular, as ideas of general acceptability, the stage is set for continued usage long into the future. In many cases the merits and justifications for these ideas may be soon lost, and the ideas persevere mainly because they have come to be generally accepted. It is through this process that accounting traditions gradually emerge. The continued utilization of ideas with little or no conscious reference to their

real merit, but with past usage being the basic force for continuation, is a prime requisite of a tradition.

Traditions develop in various ways and with varying levels of justification at their base. Some are sound from an overall theoretical point of view from the start. Others have practical justifications, growing out of the influences of various pressures exerted on accountants by management and by credit grantors. Some traditions have at their roots the influence of the income tax law. Still other traditions apparently have evolved from no particular event.

For example, a situation may arise where an enterprising accountant feels that there is need for a digression from what has come to be generally accepted. Or, possibly a client's position on a matter is acceded to because of the relative insignificance of the point involved. Before too long, however, the deviation may be accepted in other situations, probably somewhat similar, but possibly quite different. From this point of view the new action or procedure may gain some publicity in financial or professional journals, or possibly as a textbook example. As time passes the once new "exception" is adapted to new situations. After some years few can remember that the given idea was an innovation or originally a digression from the accepted practice. Soon this idea may achieve a position of acceptability, become generally followed, and gradually emerge as a tradition.

An historical review of many "generally accepted" ideas and practices in present-day accounting discloses that, even though these ideas and practices grew from a variety of motivating forces, in general there was sound practical or logical reasoning behind the ideas at the time they began to assume an important position in the accounting methodology. As previously noted, as time passes the original justification of what are now traditions of accounting is lost. In addition, as time passes one loses sight of the economic and business conditions existent in the early development of some logical ideas and practices. As the justifications and conditions which promoted an old idea are gradually lost, the fact of general acceptability remains as a potent force justifying the continuance of the idea or practice. In some instances this fact of general acceptability is a far stronger force for continuation of a traditional idea or practice than the original practical or theoretical soundness behind the tradition.

THE INFLUENCE OF TRADITION

It is not unusual for ideas which do become generally accepted to assume a rather strong force. This is true even though accountants are faced with ever-changing business problems, just as their clients are faced constantly with new problems and new situations. As deviations from the accounting practices in force are suggested, the accountant frequently points out that generally accepted practices and principles do not embrace the concepts involved in the new proposals. One does not have to search very far to find examples where reference to a lack of general acceptability has retarded the institution of new ideas. Thus, the force of general acceptability tends to promote continuation of traditions by pointing out their very fact of acceptability and past usefulness. The force of general acceptability also acts as an effective deterrent to acceptance of new ideas by pointing out their lack of general acceptability or their conflict with the "tried and true" ideas found in past practice.

There is little question that this characteristic of perseverance which attaches to an idea or action that has become generally accepted injects a possible danger into accounting thinking. Not only does

the proponent of a new idea or action need to build a strong case in justification of his proposition, but he must also be able to overcome the aura of general acceptability surrounding old ideas. In circumstances such as these one would expect to find that criticism of tradition would result. Such has been the case throughout the development of accounting.

CRITICISM OF TRADITION

Many of those who would criticize accounting today follow a pattern of approach that has proved successful in most situations in which conflicting forces exist. After discarding the "surprise attack" approach as being a generally inapplicable means of gaining acceptance for a new idea in accounting, critics turn to another accepted pattern for victory. This is to attempt to tear down the enemies' defenses, and, after they are substantially weakened, to rush into the breach with all the forces at one's command. Thus, arguments for new approaches to or extensions of the existing accounting methodology are frequently preceded by attacks on the existing mechanism as being hidebound with tradition.

As a result of such attacks, "tradition" today has a rather undesirable connotation in accounting circles. Through "guilt by association," critics of certain existing accounting practices attempt to impair the acceptability of long-used and possibly still useful areas of accounting methodology. They speak of "restraints imposed by tradition," "the force of traditional influences," "the hampering effects of traditional practices," as if tradition were a plague upon the accounting profession. It has become fashionable to attach the label of tradition to any idea which one wishes to overcome in gaining acceptability for a new approach or concept.

The effect which present-day critics wish to achieve by attaching the label of tradition to portions of existing accounting practice is obvious. If an idea is traditional, it is old. If it is old, it is probably outdated, out-moded. If it is out-dated, we ought to find a new approach in closer accord with existing circumstances. At this point the critic interjects his proposed theory and presents his justifications.

The weakness inherent in criticizing an idea or practice on the basis of its being traditional should be apparent. A tradition evolves over a long period of time, through continued usage and acceptability. The very basis for any idea or practice to be regarded as a tradition is its acceptability and usage over an extended period. A criticism of an idea because it is traditional is in reality a criticism based upon general acceptability. Should an old, useful idea which is traditional, generally accepted, he discarded solely because one attaches the label of "tradition" to it? If so, should not the result be the same if the label "general acceptability" were so attached? At the present time in accounting, many writers apparently feel that the fact that an idea is traditional is suggestive of inherent weakness, rather than being a point of inherent strength.

CAN TRADITION AID GROWTH?

The fact that the presence of traditions in accounting can be a strength in aiding accounting development is generally overlooked. In a profession such as accounting, continuing success is predicated on the ability of accountants to increase the reliance and understandability which the public attaches to the results of their work. As in any profession, success and recognition in accounting come to those whose work gives clear evidence of reliability. It is through this evidence of reliability that the results of accountants' efforts become accepted by the interested public. Reliability (and thus, acceptability) does not flow from frequent adoption

of unsound practices, from constantly altering one's approach to similar business situations, nor even from altering one's basic approach as business conditions fluctuate. Each change undertaken tends to result in at least a temporary reduction in reliability, although in many cases an increase in reliability will be the ultimate result.

Before changes are instituted in the existing accounting framework, accountants need some assurance that such changes will increase reliability and understandability of accounting results. Before suggested changes become generally accepted, accountants must be reasonably assured that the usefulness flowing from the change will more than compensate for the loss in understandability that will result from the alteration of an existing accepted practice. While many critics emphasize the slowness with which accounting absorbs new ideas, thus implying a slowness in accounting progress, these critics overlook the fact that tradition encourages a degree of sureness in accounting progress. That there are weaknesses in the existing methodology would be admitted by most accountants, but these same accountants would be quick to point out that few, if any, of the suggested changes have any assurance of alleviating these existing weaknesses with out introducing even greater possibilities for weakness. Changes will and do appear as assurance develops that such changes will move accounting a step closer to its established goals of greater service and usefulness to the economy.

It is unfortunate that the word "tradition" has been given such an unfavorable meaning by some recent writers in accounting. One cannot deny that accounting development has been influenced by traditions. However, the influence has not been so detrimental to accounting growth as the present critics would have us believe. Old ideas are not necessarily useless because of their age. That which has been tried and found useful may well be better than that which appears to be sound, but which has not yet met the test of practical usage. One should not always assume that new situations or conditions will require entirely new handling or treatment. In many cases "new" situations are merely different manifestations of old problems. Traditional solutions may well hold the clue to suitable answers even as conditions change. Age is not always a handicap in meeting a new problem; it may be a virtue.

Accountants need to recognize that the implications of critics of accounting are not wholly true. Traditional ideas do not necessarily carry an ultimate force of continuance. The development of accrual accounting bears too many examples of ideas which were once widely accepted, but which were later discarded, for one to believe that a tradition will be forever with us. In accounting, as in any branch of science, increased knowledge and improvement in techniques are built upon the framework inherited from the past. Such framework should not be discredited simply by attaching to it a label which has come to have a detrimental connotation.

TRADITION VS. CHANGE: IS THERE REAL CONFLICT

Criticism of accounting has been prominent in recent years because of the existence of two conflicting tendencies: (1) the definite tendency of business and the economy—in fact, society in general—to change; (2) the tendency of accountants to cling to past concepts and practices. In view of the fact that accountants are operating in a continually changing environment it is little wonder that there are almost constant pressures being exerted to alter existing practices.

To this writer the recent writings in accounting appear to carry a far greater im-

plication of the harmful effects of tradition than is justifiable. Accountants, and critics of accounting as well, should recognize that being old, being traditional, is not in itself a valid basis for criticism. When accounting actions are criticized because they are traditional, one must study the situation to see if the traditional action really has a sound basis for criticism. We need to spend more effort reviewing traditional aspects of accounting to determine if a basic soundness remains under existing business conditions. If we feel that the traditional area no longer appears useful, then we should strive to find acceptable improvements. But the change will come because of the inadequacy of the old idea, not because of the fact that it is a tradition.

We need to review continually controversial areas in accounting so that necessary improvements can be introduced. We need to review carefully all new suggestions for the growth of accounting usefulness and service. New ideas and new concepts should not be adopted merely because that which they would replace is traditional. In accounting, change must await reasonable assurance that the new idea or concept will better aid accounting development and usefulness than will continuation of these ideas or concepts that would be replaced.

For accounting to continue to grow in usefulness accountants must be able to adapt their practices to meet changing conditions. Accounting must also have a certain degree of stability so that uncertainty and disorganization are kept at a minimum. The existence of accounting traditions is effective in maintaining this desirable stability of accounting methods. Every sound accountant will agree that his profession cannot afford to become inflexible to changing conditions. Neither can it afford to embrace every new suggestion or idea that is presented for acceptance.

"We must be careful lest we, in our impetuosity, cast away a necessary principle or a desirable practice like a creed outworn."[1]

[1] Eppston, Harold, "Accounting in Evolution," *Journal of Accountancy*, vol. 70, August, 1940, p. 128.

ACCOUNTING FOR GUARANTEED WAGE PLANS

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WITHIN the past few months considerable publicity has been given to the adoption of new guaranteed wage plans by certain leading companies in the automobile industry. This development has brought forth a great deal of discussion, mostly from an economic point of view and predominantly from a management-labor standpoint. However, the accounting aspects of these new developments have not been adequately discussed —in fact, accounting literature on the subject is almost non-existent. This is indeed unfortunate, for guaranteed wage plans bring into existence a large number of complex accounting problems.

As with pension and group insurance plans, accounting methods utilized in connection with guaranteed wage agreements differ to some extent, depending upon the peculiarities of the individual plans. Sometimes the guarantee is in the nature of private unemployment benefits, with funded reserves established to insure wages during periods of low activity. Other guarantee agreements are nothing more than wage advances whereby the employee draws on his future earnings when there is no work. The most common plans, however, are those that guarantee the worker a minimum yearly wage or a minimum number of hours of work per week or per year.

Almost all of the methods now in existence contain common characteristics sufficient to segregate them into three broad classifications: (1) wage "leveling" plans, (2) company wage guarantee plans, and (3) income- or production-based plans.

WAGE LEVELING PLANS

The wage "leveling" plan is designed primarily to equalize the pay checks of the employee throughout the weeks of the year. These plans frequently do not give rise to an employer cost, since they merely level the earnings of the employee without guaranteeing the minimum wage.

Most of the wage leveling plans are basically employee withholding plans whereby some of the earnings of the employee are withheld and are paid to him later when his earnings are low. Usually a norm of earnings per week or hours of work per week is set, and all earnings in excess of this norm are withheld temporarily. The obvious disadvantage of this plan lies in the employee's reluctance to having part of his earnings withheld. The majority of wage leveling plans have therefore created little employee enthusiasm, for they are little more than savings plans, supervised by the company.

However, some variations of the leveling method have met with a marked degree of success. Most of these adaptations make use of a fixed wage, paid in equal weekly amounts throughout the year. Under these circumstances, the earnings of the employee are level throughout the period, regardless of the actual number of hours worked. Year-end adjustments are made for the employee's excess earnings, if any, over the predetermined amount. Although the number of hours of work used as a base for computing the yearly wage range from a low of twenty hours per week in some companies to a high of forty hours in others, the average base is approximately

thirty-five hours each week, for at least forty-eight weeks each year.

The most frequently used method of accounting for payments made under this type of plan is to establish for each employee a separate payment account similar to a salesman's drawing account. When the employee's wages fall below the established norm, all amounts paid under the fixed wage plan are debited to this account. When earnings exceed the norm, the excess is credited to the same account.

The most difficult accounting problem arising in this type of plan is the choice of a time period for closing the employee's accounts. Some companies have selected a calendar year for this purpose, paying the employee a lump sum for all credit balances, and cancelling any debit balances. Other companies pay any credits remaining at the end of each year, but keep debit balances on the books for three years before striking them off.

George A. Hormel and Company developed an interesting version of the leveling method. This plan became one of the best known and most widely studied plans in the United States. At the beginning of each year the company made a detailed and carefully planned forecast of its annual production. It then allocated this estimated production to its departments and computed the labor cost needed to meet this estimated or scheduled departmental production. These predetermined labor costs became the basis for fifty-two weekly pay checks, and employees were paid for the estimated output, whether produced or not, the amounts being charged to the various departments as they were paid. When units were produced, the budgeted labor in those units was credited to the departments. If actual production during the year was less than estimated, a debit balance then remained in both departmental and individual employee accounts. This charge was held over and applied to any production in excess of scheduled amounts during future years. However, if production exceeded the budgeted amount, so that a credit balance remained, a lump sum payment was made to the employee at the year's end. Furthermore, a concerted effort was made not to release a worker except at the end of a period, so that employment was virtually guaranteed for the year at a minimum rate of pay.

COMPANY WAGE GUARANTEE PLANS

The most popular plan today is one which will guarantee that the weekly pay check will not fall below a minimum figure, but sets no limit on how high earnings may rise during other weeks of the period. This is the type of plan presently being installed in the auto industry. In effect, it amounts to a floor placed under weekly earnings to keep them above a predetermined minimum. Employees are paid their actual earnings each pay period, the guarantee coming into effect only when earnings drop below the minimum.

A major difference between the "leveling" and the minimum-guarantee type of plan is the number of employees that are covered. Where the wage process is primarily one of leveling wages, there is no excessive cost to the employer for time not worked. Consequently, a large portion of the labor force is usually covered. On the other hand, when the company unconditionally guarantees a minimum wage, the percentage of employees within the company who are covered tends to be much smaller. The Hormel "leveling" plan covered 90 to 95 per cent of the company's employees, whereas the minimum-guarantee type of plan usually covers only employees who have been on the payroll for more than a year, or those who are considered "key" employees. Most companies are reluctant to undertake the liability of a minimum wage for employees

whose value to the company is uncertain. For this reason, many guaranteed wage plans are graduated, ranging for example from a fifty-two week, forty-hour guarantee for employees with five or more years of service down to no guarantee to those who have been on the payroll less than six months. The popularity of these "graduated" guarantee plans springs from their tendency to retain the valuable employees with a minimum of liability to the company.

A variation of the guaranteed type of plan has arisen in the funded guaranteed wage. These plans are usually supported by funds established by employer contributions, and the amount of the fund limits the liability of the company. The contributions to the fund may be based on a percentage of direct labor cost, a fixed amount per employee, or a predetermined lump sum. Funding is most common in union negotiated plans, or where the employer is reluctant to undertake the liability of a fully guaranteed wage. The plan is in reality only partially guaranteed, for unexpected economic conditions could wipe out most of these funds in a few weeks if wholesale layoffs were necessary.

INCOME- OR PRODUCTION-BASED PLANS

A third type of plan devised in an attempt to guarantee wages is one whereby employee wages in toto are based upon the income or production of the company. This should not be confused with the profit sharing plan, wherein the employee receives in addition to his base pay a portion of the company's profits. In the income- or production-base type of guarantee the income or production of the company is the basis for determining the employee's *total* pay.

A plan used by the Nunn-Bush Shoe Company is an illustration of this type of wage guarantee. The company's management, through analysis, found that total yearly labor costs hovered with striking consistency at around 20 per cent of the wholesale value of the yearly sales. They then established a plan whereby a "group salary fund" was set up at 20 per cent of the wholesale value of the estimated sales for the coming year. This annual amount was then divided among all employees, according to the individual's occupation and length of service. Each employee's weekly pay check was computed as 1/52 part of his allotted share of the total wage budget.

The "group salary fund" account was actually a control for all the individual employee's drawing accounts. Each week, as finished products were completed, the budgeted labor in each unit of output was credited to the individual employee's accounts, and the total was credited to the salary fund account; when paychecks were issued, the amounts were charged to the individual drawing accounts and the total was charged to the salary fund account.

However, the salary fund account was required to have at all times a credit balance of not less than 5 per cent nor more than 12½ per cent of the yearly estimated labor cost. If the reserve went above the maximum, monthly "adjustment" checks were issued, but if the balance dropped below the minimum, weekly pay checks were decreased.

This type of plan obviously did not guarantee any worker a fixed weekly wage, but it did tie the paychecks directly to the company's welfare. There is no denying that this type of arrangement provided the employees with a feeling of "belonging to the team."

OVERTIME PREMIUM EXEMPTIONS

One of the most complex accounting problems arising out of recent developments in guaranteed wage payments is concerned with the special exemptions allowed for the payment of overtime

premiums under the Fair Labor Standards Act. If a minimum wage is paid when actual earnings are low, the Federal requirement that overtime premiums must be paid during periods of heavy production would work a definite hardship in companies making use of a guaranteed wage plan. The Fair Labor Standards Act thus has provisions that exempt companies with guaranteed wage plans from the usual overtime premium requirements, if certain conditions are met. However, a bona fide collective bargaining contract must be in force for an annual or a semi-annual guaranteed wage before the company is eligible for any exemption. Even then the exemption applies only to the first 12 hours per day, or 56 hours per week.

Since the requirements for overtime exemption differ for semi-annual and annual contracts, each must be examined separately.

Semi-Annual Contracts

If the wage contract is semi-annual, the employer must not require more than a total of 1,040 hours of work in any twenty-six week period, in order to remain exempt from the usual overtime regulations. The Wage and Hour Administrator has ruled that each week begins a new twenty-six-week period, so that a form of moving average of each employee's work hours must be maintained to insure that the 1,040 hour limit is not passed. If the employee does pass this limit, he automatically becomes eligible for overtime premiums retroactive for the past twenty-six weeks on all work in excess of forty hours per week. A mistake in keeping the record of an employee's hours could be very costly, and a few hours of rush work performed without checking this record could cost the company a sizeable sum in retroactive overtime. The clerical effort involved in maintaining these records has caused many employers to elect not to take advantage of the exemption privilege, continuing to pay premiums on the usual basis instead.

Annual Contracts

The same basic rules apply to annual as to semi-annual contracts; that is, no overtime is paid except for work in excess of twelve hours per day or fifty-six hours per week. However, the governmental requirements to qualify for exemption under an annual plan are much more rigid than those for semi-annual plans. If the annual wage plan is to qualify for exemption, the following conditions must be met:

1. The annual wage plan must guarantee the employee at least (a) 1,840 hours of work annually, or (b) forty-six weeks of work at the normal number of hours per week, which cannot be less than thirty per week.

2. There must be an absolute limitation of 2,240 hours of work for any employee in any period of fifty-two consecutive weeks.

3. If and when actual hours of work exceed the number of hours guaranteed per year, the employee must thereafter be paid time and one-half for all hours in excess of forty per week.

4. If the employee's actual hours of work exceed 2,080 hours in any fifty-two week period, he must be paid time and one-half for all hours in excess of the 2,080. As under the original law, this means literally *any* fifty-two-week period, each week beginning a new period of fifty-two consecutive weeks.

When overtime exemptions are taken on an annual wage guarantee, a strict count of the hours worked by each employee must be maintained, for his wages change as the number of hours worked accumulate. From 0 to 1,840 hours, no premium is paid except for over twelve hours per day or fifty-six hours per week. From 1,840 to 2,080 hours per fifty-two con-

secutive weeks, the employee becomes eligible for overtime on all hours over forty per week. From 2,080 to 2,240 hours per fifty-two consecutive weeks, the employee is entitled to overtime for *all* hours worked over 2,080. Finally, if the employee works over the absolute ceiling in 2,240 hours, the exemption is completely lost for the period. The employee then becomes eligible for overtime premiums retroactive over the whole fifty-two-week period for all time over forty hours in any week.

Obviously the payroll department has a heavy responsibility under contracts such as these in accounting for every hour worked and in maintaining accurate records on each employee. An error can be even more costly here than under a semi-annual contract, since an overtime premium retroactive over a fifty-two-week period could naturally be much larger. The necessity for recording hours worked on a moving total basis greatly complicates the maintenance of payroll records, for there is no breakpoint for beginning the accumulation anew. The payroll department, the personnel department, and the employee's immediate supervisor must stay in close contact, watching carefully to see that no employee is allowed to exceed the maximum. In fact, if a sizeable number of employees were close to the maximum, the additional effort and trouble in keeping up with the hours worked might cost more than the savings on overtime premiums. As in the case of semi-annual guarantees, many companies with annual wage contracts elect not to take advantage of the exemption privilege.

ACCOUNTING TREATMENT OF GUARANTEED WAGE PAYMENTS

Another accounting problem arising from the use of guaranteed wage plans is how to enter payments made for time not worked into the flow of costs. The simplest, and perhaps the most accurate method would be to estimate the total yearly wage cost, including any guarantee payments that will be made, and pro-rate that total wage cost over the yearly production. The entire wage-cost arrangement would therefore resemble a standard cost system, with resulting variations either over or under actual labor costs.

However, the degree of uncertainty in making the labor cost estimate creates strong objection to this method of handling the wage payments. Usually, as a matter of expediency, any wages paid for time not worked are entered into a separate account as paid. The question then arises as to whether this account represents a non-production cost, caused by periodic conditions which give rise to the payments, or whether it represents a normal production cost which should be allocated to all production of the period. At first glance, payments made under the guaranteed wage plan for time not worked may be considered non-production costs, for they certainly arise because units were not being produced. Further, they may be non-recurring costs, for they are peculiar to current economic conditions.

On the other hand, there is no denying that payments made under the guaranteed wage agreement that are over and above the employee's actual earnings are costs incurred for the purpose of maintaining the labor force intact. These payments would not have been made if the company had not desired to keep its labor force together as an efficient, trained group. If production costs are to include all outlays necessary in the production of a finished product, which would include the cost of maintaining the labor force, guaranteed wage payments would then surely be considered production costs. This argument seems to be the stronger of the two, and it thus appears that these new wage costs should be treated as normal production outlays.

Regardless of the method of accounting for the payments, however, the record-keeping processes will be increased substantially. The maintenance of adequate records for these wage plans entails an accurate count of hours worked above and below the fixed norm, classification of employees for eligibility, and, in addition, maintenance of all the usual payroll records. The record-keeping process is further complicated if the company is to take advantage of the overtime premium relief provisions of the Fair Labor Standards Act. In fact the record-keeping process will be so increased that the over-all cost of the guaranteed wage plan may be distorted without inclusion of the administrative-cost element.

THE ATTRACTION AND SELECTION OF ACCOUNTING TEACHERS*

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INTRODUCTION (HERMANN C. MILLER)

COLLEGE freshmen's lack of interest in professional accounting training is largely due to ignorance of the exceptional opportunities which such training promises. Advisors, vocational counsellors, and faculty members, unfamilar with the many opportunities in business enterprises, in governmental agencies, and in educational institutions, have frequently encouraged "the halt, the blind, and the introvert" to attempt educational programs with an accounting major. Probably the most promising accounting students enroll in the program because of natural curiosity and interest in the inner workings of the economic enterprise.

Traditional ideas of the accountant, portrayed in Dickens' famous character, Uriah Heap, together with the current assumption of the title "Accountant" by many accounting clerical workers, have not stimulated college freshmen to consider accounting as a career. This is unfortunate, for not a few students learn too late of the wide variety of experiences available to a man trained in accounting, and through those experiences, the opportunities for advancement to high level positions.

The "attraction of accounting teachers," like the attraction of young men to a variety of industrial accounting positions in the controller's division in business or industry, or to fine governmental careers, or to the public accounting profession, must depend initially upon overcoming this ignorance.

Many stories have been written about the wonders of engineering—electronics, atomic reactions, and rocket propulsion. These things capture the imagination of youth. They create a lasting impression of an aura surrounding these vocations. Similarly, the wonders of medicine, of architecture, of agriculture, of law, of veterinary medicine have been paraded on stage, screen and television. Stories have been written about business. One of the best of these, *Executive Suite*, which portrays the tensions and struggle for power and authority among the top flight executives when the President of the company dies suddenly, relegates the controller to a secondary role although he was clearly one of the best qualified and most dependable of the entire group.

A need exists for a good story-teller who is convinced that the accountant plays a very high role—indeed the highest role in real life—in many very important and worthwhile activities serving mankind. The place of commerce, industry, and finance in the growth and extension of a high standard of living need not be explained to this audience. But the teaching of this fact—the elaboration of it with enthusiasm—is a responsibility of every teacher of accounting. But, of course, you must believe it if you are to be convincing.

The attraction of young men to the teaching of accounting depends, first of all,

* This paper was presented as a basis for discussion at a round table at the Annual Meeting of the American Accounting Association, Philadelphia, August 31, 1955, and was completed just prior to Professor Miller's untimely death on October 4, 1955.

upon the attraction of a greater number of *fine scholars* to the collegiate schools of business or to business courses offered in liberal arts colleges.

Secondly, having attracted fine scholars to the study of commerce, industry, and finance, it is equally important that they should not be alienated from accounting because of an early and intensive exposure to "record keeping." It is also important that the teachers with whom they come in contact possess good qualities of leadership and personality. Enthusiasm for the profession is primary. Without it certainly one cannot look for sustained interest in a study as exacting and demanding as accounting.

The third important thing is to hold before the promising student the incentives, the variety of opportunities, the fascinating life which a career in accounting offers. These are real—not imaginary. But the teacher should be thoroughly convinced that they *are* real.

Not only is the field of accounting suffering from traditional and outdated notions, but the teaching profession generally has not been held up to the youth as something for which to strive. A very fine comedian has made ridiculous the role of the teacher. What bright young man can be expected to want to become a "Mr. Peepers," except in television? The long-standing neglect of reasonable compensation for teachers plays a large part in the present attitude of the younger generation toward the teaching profession. Unskilled laborers are frequently well paid in comparison with the young university or college teacher. This must be, and I believe is, now being corrected. But it takes a long time to overcome the damage done through the past decades of neglect.

Here are some criteria for the selection of accounting teachers:

(a) Good physical appearance, neatness in dress, professional bearing and attitude, and a good voice and speaking ability.

(b) Sound underlying education having sufficient ***breadth and depth*** to provide a cultural background.

(c) Technical proficiency through study, research, ***and practice.***

(d) Cheerful and enthusiastic disposition with an interest in people. The attitude of "The Little Red Hen" who always said, "I'll do it."

DISCUSSION (ARTHUR M. WEIMER)

Dean Weimer raised a number of questions for discussion by the members of the session. This discussion centered around the following questions, some of which were given more attention than others. The answers presented here are believed to be fairly representative of the points of view which were presented by those in attendance at this session. The answers are presented in summary fashion, and as a result, a number of interesting comments could not be included.

Special mention should be made of the discussion by Thomas H. Carroll of the Ford Foundation. He emphasized the importance of developing new approaches to the teaching of accounting and also the need for devising methods for increasing the productivity of faculty members in this and related fields. He emphasized the problem which he stated in the following terms: How can larger numbers of students be taught in smaller classes with only limited increase in the number of faculty members? He emphasized the need for experimentation with a view to finding answers to this problem.

1. What are the primary attractions of the teaching profession at the college or university level?
   A. Personal desire to teach either because of interest in the subject matter and the extension of existing knowledge or interest in students and in their development.
   B. The type of life offered by teaching; considerable independence of operations, freedom to pursue one's chief interests, leisure time, association with other faculty members and students in a university climate,

opportunity to bring up a family in a college environment.

C. Security—the tenure system probably offers the greatest job security that can be found. It is not only a guaranteed annual wage but also a permanent job.

D. Fringe benefits—although these are now probably outdistanced by business, sabbatical leaves, summer vacations, retirement programs, and the like hold some attractions.

E. Opportunity for independent writing, research and consulting activities to supplement basic income.

F. Academic freedom—relative freedom from the outside pressures, pursuit of truth as seeker sees it.

2. Are these attractions as great as they were two decades ago?

Probably not. The depression undoubtedly sent a number of able people into university work, partly because of the relative lack of opportunities in business but also because security in a job held great appeal at that time.

University work now offers relatively little leisure time, and it may never have have done so. The demands on a faculty member's time appear to be increasing—he is more and more thought of as a public servant and less and less as an "ivory-towered" scholar.

The pay differentials are large. Faculty salaries on the average are just beginning to approximate in purchasing power the levels of 1939–40. Nearly all other learned professions have advanced much more rapidly. Salaries in business are much higher relatively today than 15 or 20 years ago. Fringe benefits in business now tend to outweigh those of universities. One exception may be the College Retirement Equities Fund which ties retirement income in part to equities.

College still offers great security but the relative difference appears to be less than it was 15 or 20 years ago; it may of course prove to be more important at some future date.

3. Is the attraction and selection of accounting teachers necessarily different from the attraction and selection of teachers in other areas of business?

Probably not. Demands have been heavy in all areas. If anything, the competition for well-qualified accountants from business firms and government agencies may be slightly heavier than in some of the other business areas. While our schools are beginning to pay good starting salaries, the well-qualified person who goes into business soon attains an income well beyond the top level that is likely to be paid by universities.

4. What are the best methods for attracting teachers in accounting?

The most important factor is the creation of interest in teaching at an early stage. Most of the people who go into teaching have been influenced in this direction by instructors or professors who have suggested to them that they would do well in this area of work. Thus, the primary responsibility for attracting young people probably rests with those already in the teaching profession. Beyond that they are attracted by opportunities for doing graduate work and of special importance in this connection are fellowships and scholarships which help to defray the costs involved. Some people have a "natural bent" in the direction of teaching, but of course talents of this type can be used to advantage in business as well as in university work.

Some people are attracted by the kind of life which is offered by membership on a university faculty. Traditionally, there is greater opportunity for leisure, longer vacation periods, and formerly some greater assurance of retirement programs. More recently the retirement programs of business have far surpassed those offered by the universities.

5. Are there any special attractions in the university field which may induce young people to enter this area of work now?

The attractions are probably less than at an earlier stage. The demands of university work are rigorous. The opportunities for leisure and long vacations appear to be less than they were a generation ago. On the other hand, opportunities for supplementing income through consulting work have improved considerably, and fringe benefits such as sabbatical leaves, group insurance, hospitalization benefits and the like have improved although not necessarily to a greater extent than in industry.

One of the things that is needed particularly for faculty people is major medical insurance and protection against unusual hazards. One of the advantages of the teacher is a chance, in effect, to go into business on his own without capital other than the amount required to complete his education. This is one of the great advantages of the tenure system. Once a faculty

member attains tenure, he is in effect the owner of his job and cannot be fired except for gross misconduct or because of inattention to duty. Thus, a permanent faculty position gives him a base of operations with an assured minimum income and if he is able to supplement such income by writing, lecturing, or consulting work, he may be able to arrive at a fair income position. His only chance for gaining a large income, however, is likely to come through the writing of books which happen to attain a major sale. All of this work means that he is handling a full-time job plus some additional work beyond this requirement. So long as he can keep his summers free, however, there is a good chance of his being able to do this.

6. What is the responsibility of practicing accountants for helping universities to attract good teaching personnel?

Obviously, business needs well-trained young men. With the growth potential of the American economy, demands are likely to continue high over many years. Unless business assumes a greater proportion of the training function, business firms must rely on the universities for providing well-trained young people who will become staff members of their organizations. This responsibility can be discharged in a number of ways. In the first place, financial aid especially in the form of fellowships and scholarships will be very useful. In the second place, use of faculty members for consulting work provides real assistance. In the third place, cooperation in providing up-to-date study materials and the like is helpful. It is not believed that there should be any attempt to prevent business from competing for well-qualified young people. The available opportunities should be made known to young people, and it should be their decision as to whether they should enter business or go into teaching. At the same time, those actively engaged in business should not disparage the teaching profession, and they should not discourage those who have some interest in going into this kind of work.

We need greater recognition for our university teachers and for the most part business has been slow to accord such recognition. Perhaps university people have not as yet deserved it, but the situation has improved substantially, especially in the post-war years. Similarly, business should not encourage people who do not have the capacity to succeed in business to go into teaching. Essentially, the same kinds of qualifications for success are necessary in both areas, and we cannot in teaching make effective use of cast-offs or those who do not have the capacity for business success. Similarly, it is difficult for us to use people who have spent a lifetime in business and are nearing the retirement age. Teaching is a specialized profession. Some good businessmen are good teachers, but they cannot hope to succeed in this area unless they make it a major career any more than teachers could hope to succeed in business after retiring from teaching. A few retired persons, because of a wide range of interests and the necessary personality characteristics, are able to succeed in teaching, but they are unusual.

7. What are the major problems in selection of accounting teachers?

The problems here are little different from those of selecting good teachers in other areas. Good education and sound scholarship are basic prerequisites. Beyond this, personality factors are important as are ambition, energy, interest in students, as well as interest in subject matter. Good teachers work effectively as members of organized teams and they will not necessarily succeed equally well in all schools. Much depends on how well they will gear into a given faculty situation. Hence, it is difficult to use tests and similar guides. The selection process ultimately becomes an art and those doing the selection must, through their experience, develop the ability to determine whether specific persons will fit into a given situation. The requirements of the present day faculty member are rigorous. Unless a teacher is really interested in working, he will not succeed. A university faculty is no place for a person who thinks of such a position as a kind of semi-retirement.

ACCOUNTING IN THE EXECUTIVE PROGRAM*

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A POLL of the participants in this round table indicated that there were represented some twenty programs (at thirteen different educational institutions) designed for people employed in business. These courses varied in length from 2 to 52 weeks, in number of participants from 15 to 70, and in accounting content from none as such to 100 per cent. At least one program was started as early as 1931; several had been given for the first time this year.[1] Consequently, it was not easy to discover a common meeting ground for discussing the role of accounting in *the* executive program. It appeared, however, that the typical offering was of about four weeks' duration or, if conducted on a more extended basis, was approximately equivalent in terms of actual contact time to a four-week "in residence" course.

As pertains to content, the distribution of opinion was distinctly bi-modal. As nearly as the chairmen could determine, those who spoke from the floor were about equally divided in numbers and about equally strong in their convictions:

> On the one hand, that accounting should not be taught as such, but instead taught by demonstration of its role together with those of other disciplines in the solution of realistic business problems;
>
> on the other, that there is a real need for wider understanding of the accounting function, and that this need is most effectively met by direct instruction in accounting theory and practice.

Fortunately, due to the care exercised by President Willard J. Graham in the selection of chairmen, the chair was similarly split on this issue, thus maintaining a balance of opposing views favorable to spirited discussion.

Professor Jerome, after a few introductory words by Professor Hill, stated his position as follows:

In these management programs I suspect that we will find quite a few active adherents of a fairly formalized approach to accounting. Others, including myself, will be found just as staunchly arguing that the accounting segment of these programs is merely a means to other ends. Thus the teaching of accounting in any formalized sense becomes quite incidental to such broader objectives as developing a better understanding of accounting's overall contribution to a business.

Because of these inevitable differences of opinion as to the role of accounting in management courses, I suggest first setting up at least three check points against which to contrast such differences as do exist.

The first of these check points might properly concern the particular objectives that the faculty of any of these management programs want the accounting segment to accomplish. My guess is that the general objectives of the accounting segment tend to be similar in the various programs. These objectives might be described

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* This paper is based on the discussions at the roundtable (Section III, No. 13) at the Annual Meeting of the American Accounting Association, Philadelphia, August 31, 1955.

[1] A summary of this information can be obtained from Professor Hill, School of Industrial Management, M.I.T., Cambridge 39, Massachusetts.

as involving a hope that the participants will develop a greater understanding of how accounting data can help each of them in their own day-to-day operations. In addition, it is presumably hoped that the participants will have a greater appreciation for the contribution of the accounting function to the over-all well-being of a business, especially in the sense of facilitating planning, controlling costs, preserving assets, and minimizing taxes.

The second check point has to do with the way each of these programs delimits the field of accounting. In other words, what aspects of accounting should be covered? For instance, to what extent does a knowledge of accounting involve an understanding of bookkeeping techniques, of financial accounting, of cost accounting, of auditing, and the like? Or, again, for the purposes of these courses, is a knowledge of budgeting and budgeting techniques either a substitute for or a necessary corollary to a knowledge of accounting? Or, again, is there a body of learning that can be discussed under the heading of "managerial accounting" as contrasted, let us say, with more technical aspects of accounting involved in the areas of taxation, systems, and financial accounting? Put somewhat more succinctly, what do you have to teach in order to say that you "teach accounting"?

The third check point concerns the manner in which the various programs seek to achieve whatever ends are agreed upon in One and Two above. Involved here is the teaching technique used. For instance, does the accounting segment start off with a study of bookkeeping procedures, or is possible to embark at a somewhat higher level—using case studies perhaps? Involved here also is the amount of time it is decided to allocate to the accounting phase of the program.

My own beliefs regarding the role of accounting in these programs may best be expressed by a series of premises. These premises in turn may serve as a basis for discussion.

Premise One is that the time spent on the teaching of accounting in these programs should be rather difficult to differentiate from the time spent on other aspects of the program. Certainly a great deal of the "accounting" in any of these programs should be taught by other than the accountant on the faculty. The teaching should come from illustrations used in the marketing, production, and other areas. Although I handle roughly 18 per cent of the classroom time in the Syracuse program, considerably more time than this is given over to an analysis of accounting matters by other members of the faculty.

Premise Two is that neither the teaching of bookkeeping techniques nor an analysis of the flow of accounting data through the various ledger accounts is necessary to an understanding of the managerial uses of accounting. I regard all accounting data as basically a reflection of a variety of business operations. Consequently, if operational problems are understood, then the accounting picture should be reasonably clear once the underlying accounting assumptions and terminology are understood.

Premise Three is that the division of accounting into various subject areas, like financial, auditing, cost, systems, tends to be unfruitful in these programs. Accounting, as perhaps the basic language of business, offers an excellent medium for developing an over-all, interdepartmental point of view. Since the development of this over-all approach is a basic objective of most management programs, the segmentation of the teaching of accounting tends to be self-defeating.

Premise Four is that the budget process

provides the most logical vehicle for the teaching of accounting. Successful budgeting puts a premium upon good organization, effective communications, and an appreciation for the over-all needs of a business. Furthermore, it is a process common to the experiences of most management people. To understand this process is also to understand most of the things that management people need know about accounting.

In summary, I believe that the teaching of accounting in these management programs has required and will continue to require something of a redefinition of what it is that we are teaching and for what end. Henri Fayol's table of executive abilities, for instance, indicates that roughly 10 per cent of managerial ability or skill involves accounting matters. To devote too much time to a formalized accounting segment of management programs, therefore, may be undesirable.

A partial solution to the problem of obtaining a balanced approach to the accounting segment of these programs seems to lie in the fact that management personnel bring real on-the-job experiences to the classroom. Accordingly, accounting to them comes primarily in the shape of budgets, reports, and internal control procedures. These are everyday facts of life that must be lived with. These are the sort of things that we might profitably emphasize in the classroom. Anything that contributes to a clearer understanding of these particular facts certainly comes within the gamut of "teaching accounting."

If this sort of teaching is to be done effectively, I suspect that the accountant on the faculty will require the systematic assistance of his colleagues in the other fields of marketing, finance, personnel, and production. Accounting when presented in this way does become the language of business. Its teaching also contributes to the development of an over-all interdepartmental point of view which in turn is a common goal of most management programs.

Professor Hill's observations, as presented during the ensuing discussion, were as follows:

As might be expected, I find myself in agreement with a part of what Professor Jerome has said, and in at least partial disagreement with the remainder.

I think he has, in his list of "check points," raised the right questions. In planning either a short- or a long-term study program for business people, one should start with (1) a reasonably clear definition of objectives, proceed from there to determination of (2) the subject content pertinent to accomplishment of these objectives, and certainly give careful thought to (3) the pedagogical method most appropriate to the student group and the subject matter.

From here on our views diverge, apparently as a result of a difference of opinion as to what may properly constitute an "executive program." Professor Jerome's "premises" seem to be based on an assumption that we are necessarily talking about a program designed to define and integrate the complex processes suggested by words such as "managerial control." If we accept this underlying "premise," I shall be the first to concede that accounting method is but one of the factors involved and that it would be palpably absurd to treat it as the sole, or even predominant, element in the study program. I am, however, unwilling to accord unconditional acceptance to his point of view.

In the first place, and despite my realization that I am treading on numerous toes, I feel compelled to express my doubts as to the effectiveness of the one-, two-, three-, or four-week program which purports to cover the managerial waterfront. I don't

mean to imply that such programs are useless. On the contrary, I believe that they may be very stimulating to management people, particularly to those who can't or don't make a place in their schedules for reading and thinking on subjects not immediately related to their daily work. But I will state categorically my beliefs that occasional attendance of such sessions is no substitute for continuing in formal self-education, that we cannot possibly make big thinkers out of little thinkers in one month, and that the directed discussion of broad managerial problems is of limited benefit to the participant who is seriously deficient in the vast store of substantive knowledge necessary to cope with such problems.

This brings me to the point of offering my own basic premise: that providing business executives with a working knowledge of accounting method is a productive form of activity, something we here are qualified to do, something which can be done in a reasonably short time, and hence a perfectly valid objective for a short-term "executive program."

My own observations, together with those of my friends in industry and in education, lead me to believe that many business men are surprisingly ignorant concerning the origins of the financial data from which they are expected day after day to draw important inferences. As a result, they are either blind to the limitations of the figures or, depending on the individual temperament, so distrustful of the data they they fail to make good use of them. Which reaction is the worse I have no idea; certainly neither is good for business.

Professor Jerome's earlier description of accounting as "perhaps the basic language of business," although somewhat shop-worn, nevertheless contains a substantial element of truth. Noting that the typical high school graduate has already devoted about 20 to 25 per cent of twelve academic years of formal study to the English language, I have no qualms in suggesting that four weeks of attention by the business man to the "business language" will not take him beyond the saturation point.

I am even willing to argue that consideration of the double-entry concept (upon which accounting methodology is in a sense founded) and of the elements of systematic data processing is essential to obtaining a grasp of what accounting is all about, what it does and does not do, what it can and cannot do. And I could not be surer of anything than that the business executive needs to know and understand the rationale behind the mixture of logic and convention described as "accepted accounting practices," that constantly evolving body of measurement rules which, good, bad, or indifferent, define "profits" —a concept of rather general interest in the business world.

I have the uncomfortable feeling that, because too few executives know enough about accounting and too few accountants know enough about management, there are altogether too many situations in which there is no real basis for line-staff communication within the firm. In such cases, the accountant simply says, "We can't do it that way because . . . "; the boss doesn't have any idea what the accountant is talking about; and *status quo* reigns supreme. I am suggesting one line of attack on this problem; the other involves curriculum design also, but in areas not here under review.

Having made this plea for your serious consideration of the more limited (and hence perhaps also the more practical) objective of teaching accounting as such, let me add one further thought on program aims. I suggest that we may be a little too

eager to "get in the act," to do what everybody else is doing. I am certainly not the first to indicate that there appears to be an element of "faddism" in the present wave of executive programs, and I do not expect that my doing so will have any effect on the tide. However, it does seem constructive to suggest that, in addition to trying to identify the real needs of business, we might give some thought to whether or not we have, at our respective institutions, any special know-how or facilities to offer.

I would point out, for example, that there seems currently to exist in industry a sort of general frustration with respect to the utilization of the electronic computer as a vehicle for data processing in the accounting sense. The opportunity for special service by those schools able to bring together faculty skills in electronics and accounting is very promising. Use of the accounting system, the largest and most highly integrated component of the total information system within the business unit, as a focal point for exploration of electronic data processing problems seems to me an obvious line of attack.

Finally, let me add just a few words on pedagogical technique. Bear in mind that I am talking about a somewhat different kind of program from that conceived by Professor Jerome, and do not take these comments as direct criticism of what he has said.

I have mentioned that there seems to be a big style factor in "executive programs." I believe that this same element exists with respect to the "case method"; and I am convinced that the case method is of limited value in connection with any program designed to teach accounting to business people.

When we talk about this particular technique with respect to our regular undergraduate and graduate subjects, we usually argue that its greatest virtue lies in bringing the inexperienced student into touch with the real world, that it is a partial substitute for the laboratory as used in the teaching of the natural sciences. In the present context, where we are discussing the education of persons who have had years of exposure to completely real cases, its role is not so obvious. These persons presumably come to us because experience has not been an entirely satisfactory teacher. This suggests the need for a different approach.

Obtaining a working familiarity with accounting involves the absorption of a fairly substantial and reasonably well organized body of knowledge. The kind of student we are talking about already possesses a framework on which to hang this knowledge. The kind of program we are debating puts a heavy premium on time conservation; and even the most ardent advocates of the case method will admit that it involves a high ratio of time consumed to knowledge acquired. I contend, therefore, that case material should be used sparingly and only to the extent essential to maintenance of a high interest level (theoretically not an important problem) and to demonstration of sample applications. I would add, however, that a high ratio of class to individual study time does appear to be necessary, probably because so many business people become habituated to "talking out" rather than "thinking out" their problems.

In summary, I am all for teaching accounting as accounting, although I do not presume to argue that this is a sole, or even a preferred, aim for *the* executive program. I believe that much of the content of accounting can be effectively taught apart from marketing or personnel administration; but I freely concede that, in a discussion of "planning" or "control," accounting is only one of the many elements involved. I hold that the oft-heard state-

ment that "financial accounting is for accountants and of no use or interest to management" is a gross absurdity, and feel that no one holding a responsible managerial position in modern industry should be without a working knowledge of "financial accounting." (I am continually amazed by observation of the blind devotion to the "profit system" on the part of individuals who seem to have no idea of how "profits" are measured and hence of what they mean.) And, finally, I take a rather dim view of the value of the case method in the "accounting executive program."

DISCUSSION

Since facilities were not available for the recording of remarks from the floor, it is possible to reproduce here only the gist of those comments which the chairmen can remember. Since the chairmen were throughout busily occupied in thinking up cogent arguments with which to confront each other, they experience a perhaps understandable lack of total recall. Although all of those who spoke were identified, names have been deliberately omitted in the hope that liability for misrepresentation may thus be avoided. Some of the ideas which seemed of particular interest are roughly paraphrased as follows:

Question: What was the genesis of the MIT program, the Syracuse program?

Answer: The MIT program was designed to present in short-term form one segment of the MIT School of Industrial Management's twelve-month Executive Development program. The Syracuse program was similarly planned to focus on a particular area of significance to business, namely that of management controls. Control, it was felt, constituted a body of knowledge in itself of which accounting was but one, albeit an important, part. Both programs are of approximately four weeks' duration. Both programs also seek to capitalize upon the particular interests and skills of their respective faculties.

Question: What instructional materials and methods are used in these two programs?

Answer: At MIT, text and problem material is used, supplemented by current readings, lectures on new developments of special interest, and a limited amount of case material. At Syracuse, use is made of lectures, articles, and cases, starting off with financial statement analysis (e.g., to show meanings and relationships in addition to the sources and uses of funds) and then leading into the planning, programming, and budgetary process.

Question: Is it desirable to teach basic accounting procedures and techniques in these programs?

Answer: Opinion was divided upon this most controversial aspect of the panel discussion. There were those who felt that a knowledge of debits and credits, of primary records and accounts, was essential to an understanding of accounting. The adherents of this point of view believed that the businessmen attending management programs were assumed to have a greater understanding of and facility with accounting data than usually is the case. Others felt that it was of primary importance for these executive programs to help the businessman (1) to ask the right questions when he has to use accounting data and controls and (2) to avoid being overwhelmed by the accountant's jargon and customary conservatism.

Question: Is there any executive program which uses an "integrated" curriculum as contrasted with the traditional subject approach?

Answer: A number of universities have what they call an integrated approach to management problems. By emphasizing an essentially interdepartmental point of view in the area of problems in organization, business policy, community relations,

financial management, and the like, this approach gets away from the teaching of separate subjects, such as accounting or production or marketing. Through its emphasis on management controls and the budgetary process, the Syracuse program similarly stresses an interdepartmental approach to management problems.

Question: How do you handle those men in the general type of executive program who have no knowledge of accounting?

Answer: One or more of three procedures can be followed: (1) expose these men to accounting reports, problems, and discussions for the substantial benefits that can be derived from this experience; (2) refer them to particular articles and books for detailed explanation of bookkeeping mechanics or more technical accounting procedures; and (3) have a few special voluntary sessions where the bookkeeping process can be explained or technical problems examined.

Question: How do you teach budgeting? For example, is national income analysis used?

Answer: Specifically in the Syracuse program, the budget process is approached from a number of directions. Projections of financial statements serve as one basis for planning, programming, and organizing. The marketeer's sales forecast and subsequent setting of quotas provides another approach leading into the problem of setting inventory levels and planning the production budget. Consideration is given to the financial manager's planning of both short- and long-term capital resources. The economist's projection of national income and its distribution is also a part of the budget picture that must be analyzed, as well as a number of related statistical techniques.

Question: What kind of persons attend these programs?

Answer: It is difficult to generalize, since some programs are designed for top management and others for middle and lower management. Some programs, like that at MIT and, to a degree, Syracuse, have limited objectives as contrasted with those offered at Columbia and Harvard. Age, job experience, and job function are other variables. Certain differences must inevitably exist between night courses and short, non-credit courses given at locations far removed from the job. The immediate needs and objectives of those attending night courses usually seem to call for more of a "how to do it" approach than is typically true of the general management, non-credit programs.

Question: How successful have these executive programs been?

Answer: The participants are almost universally enthusiastic. Loyalty to the group and to the sponsoring university makes it difficult to get objective opinions about the intrinsic value of any given program. Furthermore, since their individual needs are as different as the programs themselves, there is no common basis upon which the participants can make an objective appraisal. Most men, however, appear to profit from such experiences, partly from the specific content, partly from the exchange of ideas with faculty and classmates, and partly from the opportunity to take a somewhat more detached look at their job, their company, and their community.

INTERMEDIATE ACCOUNTING INSTRUCTION—CIRCA, 1955*

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INSTRUCTION in intermediate accounting was surveyed through a questionnaire that was sent to 100 colleges in the Spring of 1955. Answers were received from two-thirds of the colleges.[1] The survey dealt with the state of instruction as it is, rather than as it might be, but the latter aspect was not entirely overlooked.

LENGTH OF STUDY

The course seems to be firmly established in schools offering a more or less complete study of accounting. Schools with a three-year program in accounting offer the intermediate course in the second year, typically for the full year:[2]

	Semester Hours Offered			
	2	*3*	*6*	*8*
Number of schools.....	1	19	42	1

SCOPE OF STUDY

Equally pronounced is the established scope of study, if one may judge from the textbooks used:

	Number of Schools
Book A	33
Book B.....	10
Other books (eight in all).....	20

The force of this impression is reduced, though not materially, by two further disclosures.

First is the fact that a number of schools require supplementary readings. Out of 61 schools answering this point, 18 require supplementary readings, 11 only recommend it, and 32 require and expect none. The readings mentioned were as follows:

	Times Mentioned
AIA bulletins.....	15
ACCOUNTING REVIEW articles.....	11
Other textbooks.....	10
Journal of Accountancy articles.....	9
Annual reports.....	4
Other sources (ten in all).....	3 or less

Second, certain topics in a book were omitted, even in a year course. Leading the list of topics omitted is "review of accounting process," which was mentioned 4 times. Among other topics omitted, "statement analysis" and "actuarial matters" were each mentioned 3 times.

SIZE OF CLASSES

This seems to conform generally to what is found in other junior and senior subjects, as indicated below:

	Number of Students, per Class			
	12–22	*23–33*	*34–44*	*Over 44*
Number of schools...	12	33	16	3

MAJORS *versus* NON-MAJORS

Does the intermediate course provide some breadth of background useful in specializations other than accounting? In answer it should be said that this course centers attention on topics of the broadest possible appeal of any accounting study following a year of fundamentals. More non-accounting majors should therefore be found taking the intermediate course than

* This paper summarizes the highlights of a roundtable on intermediate accounting instruction, held at the 1955 annual meeting of the American Accounting Association, at the University of Pennsylvania.

[1] Questionnaires were sent to all state universities, all other "large" universities, and a few smaller colleges. In the analysis of answers received, the writer acknowledges the help of Professor Paul E. Fertig of Ohio State University. Professor Fertig and the writer served as co-chairmen of the roundtable mentioned in the preceding footnote.

[2] Tabulations presented in this paper add up to varying totals of number of schools reporting because some answers were not clear or were omitted.

any other course beyond the first year. The answers received on this point are as follows:

	Semester Hours Offered			
	2	*3*	*6*	*8*
Required only of majors: No. schools	—	8	24	1
Required also of certain non-majors: No. schools	1	11	12	—

The per cent of non-majors in the intermediate course was another point of inquiry. The table following gives the per cent of non-majors *required* to take the course to total enrollment:

	Semester Hours Offered		
	2	*3*	*6*
Per cent of non-majors:			
Under 20 per cent: No. schools	1	4	6
20–39 per cent: No. schools	—	1	4
40–59 per cent: No. schools	—	—	1
60–79 per cent: No. schools	1	4	1
80 per cent: No. schools	—	2	—

The per cent of non-majors who *elect* intermediate accounting is less impressive; this may be due as much to faculty counselling as to students' independent judgment:

	Semester Hours Offered		
	2	*3*	*6*
Per cent of non-majors:			
0 per cent: No. schools	—	6	14
1– 9 per cent: No. schools	—	5	7
10–19 per cent: No. schools	1	4	8
20–29 per cent: No. schools	—	3	5
30–39 per cent: No. schools	—	1	2

READING ASSIGNMENTS

The custom of a "chapter a week" is still strong. If the course is a year long, this means around 20 pages of reading a week; supplementary readings, if any, would be in addition.

WRITTEN ASSIGNMENTS

The written assignments are heavy with problems but light in questions, as shown below for a typical week:

	Number of Problems Assigned					
	2	*3*	*4*	*5*	*6*	*Over 6*
Number of schools	10	24	15	8	2	2

	Number of Questions Assigned							
	0	*1*	*2*	*3*	*4*	*5*	*6*	*Over 6*
Number of schools	45	3	1	5	—	2	1	5

The above pattern is slightly different for a few schools. In 4 schools, students are asked to scan certain extra problems related to those formally assigned. In 3 schools, assignments were also made from a "work book." Two schools assigned "short papers," and 3 schools assigned a term-long paper, in addition to weekly written assignments.

Should written assignments be graded or just checked off? The answer to this question showed that two-thirds of the reporting schools are not going to the trouble or expense of grading papers. The reason for this probably is in part a budgetary one, and in part also one of policy, to discourage students from copying solutions from graded papers. The tabulation on the question follows:

	Number of Schools
Papers: Checked; check recorded	12
Papers: Checked, reviewed; check recorded	29
Papers: Graded; grade recorded	23

Only two schools reported that written answers are distributed to their classes. The great majority of the schools (44) discuss answers orally with the aid of the blackboard. A surprising number (18) kept their silence on this point, leaving the inference that answers are not discussed, at least as a regular practice.

The weighting of written assignments in making up final grades varies from an automatic one-third of grade in course down to zero, as shown below:

	Number of Schools
Weighted (one-third to one-tenth)	19
Not weighted, but must be satisfactory	24
Considered in marginal cases only	8
Not weighted	8
Various penalty schemes, if unsatisfactory	5

Where papers are weighted, 3 schools give a weight of one-third of grade in course, 8 schools give a weight of one-fifth and 8 schools give a weight of one-tenth.

EXAMINATIONS

A pattern of three one-hour tests seems to be the most popular with teachers:

	Number of One-Hour Tests							
	0	*1*	*2*	*3*	*4*	*5*	*6*	*Over 6*
Number of schools	1	2	17	26	10	2	3	1

Less-than-one-hour tests find few advocates, judging by the answers received on this question:

	Number of Short Quizzes							
	0	*1–3*	*4–6*	*1–6*	*7–9*	*10–12*	*7–12*	*Sundry Plans*
Number of schools	32	4	8	2	3	5	4	5

Final examinations are given in all but one of the reporting schools. The two-hour examination was mentioned most often (42 schools); the three-hour examination ranked next (19 schools); and one school gives a five-hour examination.

Weighting of examinations for purposes of the final grade is more consistent between schools for final examinations than for one-hour tests:

	Per cent Weighted				
	Under 21	*21–40*	*41–60*	*61–80*	*Over 80*
Final exam.: No. schools	4	42	12	2	1
One-hour tests: No. schools	5	19	19	15	1

Turning to the make-up of final examinations, problems easily outrank all other types. The non-problem types fare as follows (figures refer to number of schools using each classification):

a. True, false questions	14
b. Completion questions	14
c. Multiple-choice questions	19
d. Essay questions	41

The reporting schools are approximately evenly divided in the use of essay and types a, b, c questions. The value assigned to problems in a final examination is high, as shown in the following:

	Per cent Weighted				
	Under 20	*21–40*	*41–60*	*61–80*	*81–100*
Problems: No. schools	—	3	7	13	34
Questions:					
Type a, b, c: No. schools	48	5	3	1	—
Type d: No. schools	40	13	4	—	—

LABORATORY

The intermediate course is definitely conducted on a lecture- and discussion-basis. Only 6 schools of those reporting require an hour or two of weekly laboratory and 3 make the laboratory optional with extra credit. Some teachers believe that it is not too early in the program, for schools stressing C.P.A. preparation, to use laboratory sessions for practice in techniques of problem solutions and clocking the time it takes to complete solutions.

TEACHER POLICIES

Should teachers be tagged for intermediate accounting as one of the specialized fields in which to teach? The answers received show that 31 schools regard the intermediate course as a specialized field; 16 do not, rotating teachers; 5 have combination policies; and 12 pursue no positive policy on the question. The rotation plan is surprisingly unpopular although this plan would seem to have the obvious advantage of inducing teachers, otherwise too busy, to keep abreast with developments in general theory.

In answer to another question, 22 schools assign the intermediate course to "older" teachers; 4 have a policy opposite to this; and 38 have no positive policy. There is still much prejudice, therefore, against having younger teachers handle this and other junior and senior courses.

CHANGES PROPOSED

Nearly every school answering the questionnaire had something to say for improv-

ing instruction in intermediate accounting. However, there was little agreement, as is shown in the following:

(*1*) *Teaching Methods*

Leading the list of suggestions was "use more visual aids," which was mentioned by 14 schools. "Use laboratory for extra problems" was suggested by 5 schools. Other suggestions, mentioned two times or less were: teach from problems, lecture less; spend more time with "why" questions; and use graders and grade problems assigned.

(*2*) *Written Assignments*

No strong feeling for change was evident as to written assignments, but 6 schools did urge the use of more essay type questions, and 4 asked for more problems stressing "managerial decisions."

(*3*) *Textbooks*

The attitude toward the textbooks available is one of general blissfulness. This could be due to an attitude of letting well enough alone, suggesting something of a general complacency; on the other hand, it may stand for a genuine belief of solid attainment by the textbooks used. At any rate, the largest urging was for "more attention to principles, less to mechanics," mentioned 5 times, and "develop more analytical reading," also mentioned 5 times. Among the rest of the suggestions, mentioned 2 times or less were: give more examples, less discourse; pay more attention to income determination; avoid discussion of too many alternatives; and "books should be easier to read."

As to the character of written assignments in textbooks, 5 schools asked for more "cases"; 4 for greater variety in problems; 4 for closer tie-in with text reading; 3 for less C.P.A. approach; 2 for more "realism"; and 2 for more helpful formats in presenting problems in order to reduce solution time.

(*4*) *Supplementary Readings*

A small number of schools (5) proposed more use of AIA and AAA material in the form of pronouncements and magazine articles as a way of improving instruction.

(*5*) *Place in Program*

There is general satisfaction with the present place of the intermediate course in the accounting program. Seven schools not fully satisfied propose that the course be opened to sophomores, implying that the elementary course should be opened to freshmen. Fifteen schools suggest a longer course; 10 of these currently offer a three-hour course, and 5 currently offer a six-hour course.

(*6*) *Sundry Proposals*

Among other suggestions made, 4 schools would like to see the size of classes limited to 30 students; 3 wish the course could be made more attractive as an elective; 3 think non-majors should be segregated into a separate class; and 3 suggest that a semester of cost accounting should be made a prerequisite.

LOOKING FORWARD

The survey showed great interest in intermediate accounting instruction, a general desire to experiment with changes, and ample alertness for practices going on at other schools. None of these conditions, however, can be said to have reached a sufficient state of ferment to lead one to think that large and drastic changes are on the way.

Since the textbook used sets both the breadth and depth of a course, may one assume that future development of intermediate accounting instruction rests mainly with writers rather than teachers? The record to date is inconclusive, for teachers write and writers teach. It may be observed, however, that the last five years have seen three or four books designed for

the intermediate course that have definitely veered, in varying degrees, from the conventional approach. None of these books have received anything more than negligible consideration. The vast majority of teachers remain unconvinced that the writers in question have produced an improved product. The vast majority of teachers remain unperturbed by the criticism of one of these writers (whose approach represents the sharpest departure yet) that the conventional-type book is "hit-and-miss bundling of assorted topics as opposed to careful selection of related material." The verdict, in other words, is for a book which follows the time-honored treatment, at least in the foreseeable future.

BRINGING ACCOUNTING CURRICULA UP-TO-DATE*

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THE purpose of this paper is to call attention to the existing gap between current accounting curricula and the more recent applications of accounting data. Many accounting departments in schools of business have adjusted their curricula to meet these modern requirements or are working in that direction. But the writers believe that a majority have not kept pace with the evolution of accounting techniques and the needs of business. The reasons for this unsatisfactory situation can be traced back to the early growth of accounting practice and the teaching of accounting at the college level.

Coincident with the expansion of business organizations from small owner-operated enterprises to large professionally managed corporations, there was an evolution of accounting practices from the closing decades of the nineteenth century forward. Out of the simple techniques of cash recording there evolved an ever more complex system of financial accounts. This was primarily an accomplishment of those who called themselves chartered or public accountants rather than those who kept the accounting records of business enterprises. As a result, this particular, comparatively small, group of accountants became identified as the representative group of the whole profession both in the public mind and among accountants as well.

However, following World War I, there was another significant expansion of accounting activities from the narrower financial into the much broader managerial field, from historical accounting into predetermination, planning, control and decision making. New professional organizations were established such as the Controllers Institute of America and the National Association of Cost Accountants. But none of these has been able to match the strongly entrenched prestige of the organizations of certified public accountants. It has been an incidental but significant effect of the present conditions that the professional examination which has been especially designed to meet the requirements of public accountants and auditors is being accepted by both the profession and the general public as the supreme test of achievement for all accountants.

It is this situation which leads to the first problem which we want to discuss, namely, what is wrong with the typical accounting curriculum? When these curricula were originally set up, public accountants had a principal part in the effort. In fact many teachers were public accountants. This very close contact between college accounting instruction and the profession of public accounting has continued up to this time. In our opinion, it has tended to perpetuate the existing inadequacies of the

* This paper was developed out of Round Table No. 10 at the Annual Meeting of the American Accounting Association, Philadelphia, August 31, 1955. The following individuals were members of the round table: Herman W. Bevis, Price Waterhouse & Co.; Robert L. Dickens, Duke University; Vern L. Elliott, Atlantic Refining Co.; Billy E. Goetz, Massachusetts Institute of Technology; Arnold W. Johnson, New York University; Carl L. Nelson, University of Minnesota; Roy Stone, American Meat Institute. Excerpts from their talks have been included in this paper.

accounting curricula. We believe that these close contacts and the concomitant emphasis on the CPA examination have contributed to such deficiencies as: (1) inadequate training of accounting teachers toward meeting the needs of business; (2) failure of writers and publishers of accounting textbooks (with some exceptions) to provide a product which conforms to those needs; (3) lack of training of students in the solution of business problems and the proper analysis of more complex business situations (overemphasis of the *how* of doing things over the *why*).

ORIENTATION OF CURRICULA TO THE CPA EXAMINATION

As a result of the conditions indicated above, most accounting curricula, in the opinion of the writers, tend to reflect the requirements of the CPA examination to the disadvantage of other accounting applications. This seems to be so despite the recognized fact that only a comparatively small minority of accounting majors remain in the field of public accounting. According to data collected by Professor Rollin Niswonger[1] only 27 per cent of those who receive degrees in business administration are accounting majors. Mr. Herman Bevis referred at the round table to statistical information gathered by the American Institute of Accountants to the effect that only 20 per cent of accounting majors went into public accounting. Using 100 as an index base, this means that only 27 out of each 100 business administration majors are accounting majors and of these 27, only five or six will go into public accounting. This raises a very serious question: Should accounting curricula emphasize the needs of the five or six students who will enter the practice of public accounting or should they more logically be directed towards the much larger number who will do other types of accounting work or even to the many more who will work in other lines of business? This disparity becomes even more pronounced with regard to the first year course of accounting.

Let us assume that all business administration majors are required to take one year of accounting, that 27 per cent of these will major in accounting and that 5 or 6 per cent will go into public accounting. It seems wrong to conduct that course with a primary view to the benefits of the accounting majors or even of those entering public accounting. As Mr. Bevis stated, "The colleges must more clearly define the objectives of their curricula and decide to what extent the public practice of accounting and, therefore, the CPA examination, fits within them. As long as the CPA examination is directed toward testing qualifications for the public practice of accountancy, but the large majority of accounting students in the colleges are destined for other fields, the relationship between college curricula and the examination need extend no further than the principles and fundamentals common to the two."

Professor Carl Nelson suggests that "Fortunately for the accounting profession, instructors in accounting have not had a free hand in setting up curricula designed to train accountants. It has been . . . necessary to justify curriculum plans to colleagues who may not have an overwhelming enthusiasm for accounting courses piled upon accounting courses.' Otherwise the inadequacies of accounting curricula might be even greater!

Two specific illustrations will emphasize more clearly how closely accounting curricula have been oriented in the direction of the CPA examination requirements. First, take the case of the place of the study of consolidated statements in the accounting curriculum. As Professor Nelson says,

[1] "The Attraction and Selection of Accounting Students," ACCOUNTING REVIEW, January, 1956.

"How many students can prepare consolidated working papers in their sleep and yet not be able to interpret or know when to use consolidated statements?" And even more to the point, how frequently will accounting majors be called upon to prepare consolidated statements other than in connection with passing the CPA examination? Probably very infrequently. Yet this topic is too often included in courses which form the "core" of the accounting curriculum. It is too frequently considered to be a truly important topic and thus is included in a required course, not to the extent of a few hours, but frequently to the extent of spending as much as half of the advanced accounting principles course on the subject. This time spent seems to be all out of proportion to the significance of the topic for accounting students.

Secondly, how strongly the atmosphere of the CPA examination has influenced the thinking of educators may be seen in the attitude of accrediting agencies. They appear to accept a master's degree plus a passing grade in the CPA examination as a sort of equivalent of a doctor's degree in evaluating the credentials of college accounting faculties. This seems to indicate a feeling that the passing grade at the CPA examination is the equivalent of the work to fulfill the requirements for a doctor's degree. However, not even the staunchest supporters of the present system of CPA examinations will claim that its formal requirements exceed those for an undergraduate degree.

Most accounting curricula have failed to provide adequately for the newer applications of accounting in the managerial field. Of course, there are related topics in the program. But these are usually electives, and this tends to create some sort of vicious circle. Only a few students will register for the non-required courses. And since there are only a few students, these courses cannot be offered on a sufficiently broad scale and often not on a permanent schedule. Accounting majors will take, primarily, courses that will assist them in passing the CPA examination. But most of them will not go into public accounting and will be inadequately prepared for their future jobs. They will have learned many techniques they won't need but will be unfamiliar with the newer applications and interpretations of accounting data.

Inadequate Training of Teachers

The narrow approach reflected in the accounting curricula which are primarily concerned with the requirements of the CPA examination finds its equivalent expression in the shortcomings apparent in the training of accounting teachers. Far too many are merely technicians who know how to perform particular assignments but show little concern with their background, significance and usefulness to business management. In fact, we are all products—and even victims—of our own educational background and this applies to teachers as well as to others. How can accounting teachers show interest in a broadening of accounting curricula so they may meet the changing demands of business when they themselves have been trained to think and work in narrow technical terms as these are reflected in the requirements for the CPA examination.

We submit that before accounting curricula can be changed in terms of current business requirements, the teachers will first have to be trained to think and teach in terms of those needs. This means that the universities which turn out the future teachers must do a conscientious job of providing these men with the tools they need for teaching others along more progressive lines. Too many doctoral candidates, aspiring to be accounting teachers, take little or no accounting work after their typical undergraduate curriculum in

accounting; to the extent that they do take additional courses, they most frequently are taught along the traditional lines. Doctoral candidates usually do not learn any of the tools of their trade, such as teaching methods and procedures, and it is not typical to permit a doctoral student to conduct dissertation research in areas which could conceivably help to improve accounting curricula. For example, Mr. Herman Bevis stated that a fundamental study is needed to outline those particular areas of knowledge which can be imparted to the candidate for the profession more efficiently and effectively through experience rather than in the classroom. If such areas could be delineated, it would be reasonable to believe that the American Institute of Accountants and the state societies could educate most practitioners as to their particular responsibilities in training men for the profession. Such a program could result in a far better co-ordination of training effort than now exists among practitioners and educators.

It would seem logical that such a study as that proposed by Mr. Bevis should be undertaken by a doctoral candidate who expects to teach subsequently. But a candidate who proposed such a topic for his research would likely be told that this should be better left to schools of education. Yet how many teachers of accounting in the colleges have been educated in schools of education and would have been in a position to make such a study! The writers believe that a critical examination of accounting curricula in relation to the training of future accounting teachers is an urgent necessity.

Inadequacy of Textbooks

It is only logical that most of the widely used accounting texts reflect the system and way of thinking indicated before with respect to accounting curricula and the training of accounting teachers. The emphasis is upon techniques, on *how* to do the job rather than *why* the job should be done in a particular way. Such books continue and will continue to be popular as long as they reflect the present kind of curricula and the current philosophy of accounting teachers. In the circumstances it is not surprising that those textbooks which tried to avoid the pitfalls and shortcomings of the present system have not been too successful. It would seem that the quickest way to bring curricula up-to-date would be through better trained teachers and more adequate textbooks. Since teachers are inclined to follow the textbooks, it would appear that better books could lead to more adequate methods of teaching. However, the responsibility would be with those who are in charge of selecting the textbooks. As long as they stick to the old-fashioned texts, the newer and better ones will have an uphill struggle. Thus, in the last resort, the responsibility rests with the faculties, though publishers could be helpful by making stronger promotional efforts in favor of the better textbooks.

Emphasis on Analysis and Ability in Written and Oral Expression

A concomitant effect of the emphasis on the CPA examination has been the lack of ability among students to analyze actual business situations with a view of using their findings by means of oral or written reports. This deficiency has been pointed out by business executives time and again. As long as accounting instruction continues to "drill" students on the procedural aspects of accounting, there is little chance for analysis and the proper presentation of its results. And yet this is a vital requirement for persons who will have to use reports and statements as the principal methods of communicating their findings to management. As Mr. V. L. Elliott, Comptroller of the Atlantic Refining Company, states, "In most cases these reports

contain a maze of figures identified by technical accounting terminology. If this information is to be of any value at all, it is necessary that it be communicated to top management and operating people either orally or in writing in a clear and concise manner and in terms that can be readily understood. Although this activity is present at all levels of accounting from the clerk to the Controller, its importance is too often overlooked."

Effective expression can only result from effective thinking, and effective thinking cannot be carried on without the proper tools. Accounting curricula based on procedural aspects of accounting have not provided the proper tools for effective thinking by students. No wonder there is a popular saying that "there is always room at the top." Mr. Elliott suggests the same in stating that he often finds that individuals being considered for supervisory positions frequently "do not possess the qualifications which are essential at the management level." It would be interesting to know to what extent the blame for this can be laid at the doorstep of the collegiate schools of business!

To correct this situation it is necessary to recognize that training in written and oral expression is not only the responsibility of elementary, secondary, and liberal arts schools, but is a constant process to which close attention must be given in accounting courses. Too close correlation of the curricula with the requirements of the CPA examination has not fostered or encouraged more effective speaking and writing, mainly, it would seem, because such an approach has not necessarily fostered very effective thinking.

HOW CAN THE ACCOUNTING CURRICULA BE BROUGHT UP-TO-DATE?

Now that we have examined the accounting curricula in an attempt to determine what is wrong, we must state some concrete suggestions as to how the situation can be improved. These suggestions can be divided into two categories: general and specific. The general ones apply to the accounting curriculum as a whole. The specific suggestions pertain to specific courses within the curriculum.

General Suggestions for Improvement

Several general suggestions are as follows:

1. Free the accounting curriculum from the present predominant orientation toward financial accounting and the topics included in the CPA examination, and give equal space and time to the other major applications of accounting, particularly in the managerial field. This means emphasis on fundamental ideas and courage to believe that students will have the desire and ability to learn after they graduate. Mr. Elliott adds further emphasis when he says, "We think that a significant contribution could . . . be made by our colleges and universities toward preparing students for eventual management assignments. In fact, earlier development of accounting students before they enter business can often be more important since at that stage they are more flexible thus making it easier to correct and strengthen their pattern of thinking and their general approach to business problems."
2. Give more attention to the needs of non-accounting majors who want a broad understanding of accounting methods and their applications in business. This means that there should be less emphasis on the accounting process and more emphasis on the fact that accounting is a management tool—the use of and not the process of developing which is important to this category of student.
3. Recognize what the needs of students are and then adapt the curriculum to meet these needs. In order to do this, it will be necessary to do research to determine what areas of knowledge, if any, can best be imparted in the classroom, and which areas might better be more efficiently and effectively carried on by doctoral students. However, educators must not depend on schools of education to do this research since these schools have little or no specific

interest in the effective teaching of accounting.

4. Supplement students' technical accounting training with subjects which will give them a broader prospective of business problems and a better appreciation of those personal qualities which are important for their advancement to management levels. The National Committee on Education of the Controllers Institute of America apparently recognizes this need in advocating that the accounting student give equal emphasis to the field of liberal arts and training in such subjects as writing, public speaking, human relations, and the fundamentals of good supervision, in order to develop a well rounded academic background. The Committee points out that in industrial accounting we are still faced with deficiencies in training in the areas of human relations and communications. The ability to prepare reports and communicate them effectively is an art which can and should be developed throughout the early years of a person's life, and should not be neglected by collegiate educators who think the job should have been done before college training started or will be done when college training is over.

Specific Suggestions for Improvement

Professor Dickens of Duke University has some specific suggestions for improving the first year course. He states:

"I am inclined to agree with a statement made by Robert G. Knight, in the July, 1953, ACCOUNTING REVIEW in discussing the first year course: 'it should emphasize that accounting is a management tool, and it is how the tool can be used, and not how it was manufactured, that is at this stage important. The finished statements and reports used by business, rather than the technique which produced them will be the material. . . . In no way do I disparage the importance of a knowledge of the accounting process. It is, however, a question of emphasis, and I think it well to emphasize the importance of knowing how to use the results of the accounting process. Based upon my observation, this skill has been developed less widely than the circumstances of modern business require.'

"I would not go quite so far as to say that the course should be converted into a course in statement analysis such as Mr. Knight seems to imply, but there must be some intermediate ground that would be satisfactory."

Professor Dickens proposes that the following steps be taken to give maximum benefit to prospective accountants as well as others:

1. "Eliminate from the course special journals, control accounts, voucher register, petty cash, specialized partnership problems, and other sections inclined toward techniques.
2. Use the time thus made available to emphasize the problems of management and management uses of accounting.
3. In covering the other material, the 'why' should be stressed rather than the 'how'."

Professor Arnold W. Johnson of New York University applies the same reasoning not only to the first year course but to others as well:

"Too long have schools drilled, and drilled heavily, on the procedural aspects of accounting. While the procedural aspects of accounting deserve attention, the conventional accounting course will become more worthwhile and more interesting if attention is increasingly shifted to the 'use' aspects of accounting. Less attention should be paid, for example, to such procedures as 'closing the books' and more attention should be paid to the *interpretative* and *utilitarian* aspects of accounting. From the first to the last course in accounting, each will be a better course if it is slanted in the direction of such questions as: (1) What do the financial statements mean? (2) In what respects are these statements strong or weak? (3) What use shall be made of the information contained in these statements?"

Professor Nelson of the University of Minnesota also stresses more emphasis on thinking and less on traditional methods of presenting accounting in the classroom. He suggests that this requires a re-examination of such courses as advanced accounting, asking such questions about the course as follows: "Is this material helpful in producing a thinking accountant? Does it have any value except to polish up a student for the CPA exam?" Professor Nelson would also ask some pertinent ques-

tions with respect to courses in cost accounting, such as: "Is it necessary to spend so much time on job order cost accounting —or cost bookkeeping as one of my colleagues calls it? Does the grinding away at standard cost entries and variance refinements help the student to realize what standard cost procedures are designed to accomplish? Or is it likely that we are turning out people who believe that standard cost variances are always a signal to change the standard?"

Professor Billy Goetz of M.I.T. suggests the need for a greater awareness of the relationship of statistics and economics to accounting, and paints something of a pessimistic picture for the future of accounting if improvements are not made in teaching which will provide prospective business employees the broad vision demanded to enable them to supply management with answers to vital questions for effective decision making. Here's what Professor Goetz says:

"If you will study the new literature to discover what kinds of data are being fed into the mathematical models used for managerial decision making, you will find opportunity and marginal costs and revenues to the exclusion of average or unit data. You will find current or projected values to the exclusion of both 'Fifo' and 'Lifo.' You will find a tendency to use engineering and statistical cost estimates and economic-statistical market forecasts in the place of the products of accounting and cost systems. Controllers and accounting departments, and the accounting and controllership curricula of the graduate schools are under great pressure to adopt and to swallow these new concepts and techniques. They are resisting in the great tradition of the 'accountant is an historian' school, but cracks are appearing in the accounting front. Under the threat of losing much of the most interesting, creative and rewarding areas open to accountants and controllers to the new breed of operations researchers, perhaps the accounting literature, curricula, and practitioners will move soon enough and fast enough to absorb these promising new areas so logically theirs. In any event, these new rivals are tough babies. You can't lick them. My advice is to join them or prepare to take a back seat."

This is indeed a challenge which accounting educators cannot afford to ignore. It is time to stop patting ourselves on the back about what a good teaching job we are doing; we must re-examine our curricula and teaching methods in the light of business needs. The suggestions offered here point the way, but they cannot be more specific because of the variations in collegiate accounting curricula. Nevertheless, it is hoped that enough ideas have been expressed to provide a basis for bringing the curricula of individual schools up to date.

CONCLUSION

Mr. Roy Stone of the American Meat Institute summarizes nicely what has been discussed in this paper. He says:

"There is a need for greater recognition of the requirements of industry for accountants capable of serving as a part of the management team. Such accountants need training, not only in developing and interpreting accounting information, but also in business methods and problems. There is need, too, for training in how to present the accounting information that serves to guide management so that its value will be understood and use made of it. . . ."

"Accountants who can meet these qualifications cease to be just historians for the business, and become active players on the management team—become necessary assets—and a better source for future managers of the business. . . . Accountants who do not plan to go into public accounting could dispense with much of the training required for that field and could substitute other courses more closely related to the management field which would help qualify such individuals for industrial accounting. . . . A division of accounting into different fields, such as management accounting, taxation accounting, financial accounting for investors, etc., would seem indicated, so that students may elect to specialize in one of them. Consideration also should be given to whether accounting, like law and medicine, eventually may require a more extended course of study in order to provide adequate training."

The objective which can be used as a basis for bringing accounting curricula up to date might well be illustrated in the following quotations made by Professor Nelson in his talk: (1) "We want to train students to provide them with the equipment necessary to answer the practical questions they must face five or ten years after graduation—questions which at the present time cannot even be formulated." (2) "An educational program that enables a man to do a better job during his first six months of employment is not an educational program." Is the educational program suggested by the second quotation the type we have been conducting in our collegiate schools of business? We suspect that too frequently this has been the case. It is time to abandon our attitude of smugness and complacency, and instead approach our educational program on a scientific basis. And the time to start is now!

THAT APPLICATION OF FUNDS STATEMENT

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IN approaching this subject I wish first to state that I think the various critics of the Application of Funds Statement, and its assumed shortcomings in its usual form, are wrong in many of the conclusions they have reached. From what I have read of these criticisms, I feel that very little has been contributed thereby except more confusion. As a result, I am still of the opinion that the usual form used from the start is adequate but that it has been subjected to criticism because its terms are not clearly descriptive of either the nature of the "funds provided" or of the "funds applied."

In reading the text-books and articles on the subject, it seems to me that the authors have failed to define properly what funds are and what funding operations mean. Instead, and quite invariably, they talk almost immediately of "non-funding" operations and yet, almost before the words have been fully spoken, they include these "non-funding" operations in the "funds provided" section of the Application of Funds Statement; to a student of accountancy and to others that is rather confusing; or isn't it? To one who has seriously studied these texts and articles it becomes apparent (although sometimes very gradually), that these so-called "non-funding" operations are those which do not affect the "net worth" or the "capital" of the business. But why don't the writers say so? And, why at the same time, do they not stress that the major objective of the Application of Funds Statement is to show how and to what extend, working capital has been affected? Furthermore, why not show which items of working capital were affected? Later, we will show how an increase in working capital, as a whole, may not be as indicative of a better current position *as a decrease* in working capital.

If we start viewing this principal objective of the Application of Funds Statement, we should, in my opinion, begin our story from more realistic angles. I believe these to be as follows:

(1) That every business has a general, basic, and all-inclusive fund with which it must conduct all of its operations. That fund is its entire capital or net worth. We might properly call this its "total capital fund." Hence, operations which affect this fund are "capital funding" operations.

(2) This "capital fund" exists in two forms which we may properly call—
   (a) the "working capital" of the business or the "working capital fund,"
   (b) the "fixed capital" or "fixed capital fund." Such a segregation of these funds within the total or "capital fund" corresponds with the economist's segregation of the whole economic structure of society into circulating capital and fixed capital —both integral parts of the total economic capital.

(3) On the basis of the above segregation, we can then (in business) speak of
   (a) "capital funding" and "conversion funding" rather than of "funding operations" and "non-funding" operations. All these are funding operations effecting either (a) an increase or decrease in capital, or (b) a conversion in and between the two component funds which comprise the total capital fund, viz., the working capital fund and the fixed capital fund, such a conversion neither adding to nor deducting anything from the total capital fund.

(4) Briefly then, those operations which increase (or at times decrease) net worth, or the total

capital fund, we should call "funding" (or "defunding" for decrease) and those, which do not, but which do affect working capital and at the same time, affect fixed capital, we should call "conversion funding"; an increase in the one will effect a decrease in the other, but net worth or total capital fund would be unaffected.

FUNDING

Funding, ordinarily, occurs in only two ways, namely:

(1) from net profit retained in the business;
(2) from additional capital invested in the business.

The nature of "funding," through the retention of net profit in the business should, it seems to me, deserve clarification in text book discussion, and in the explanation of the Application of Funds Statement, somewhat as follows:

(1) A net profit results from a successful "turnover" of net worth, that is, of the total capital of a business. The process involved is that of converting the cost or determined values incorporated in the total capital, at the beginning of any period, into income or selling values. We can see, in part, this conversion of total capital in a manufacturing concern when we consider the plant values consumed (through depreciation) as first incorporated in the finished inventories, the cash values transformed into labor, material, maintenance, taxes, insurance, supervision, etc., and then, finally, have all these coupled with the selling and administrative costs, housed in the accounts receivable or cash sales. In the latter we find, finally, the addition of an amount which constitutes in full or in part, the reward for the use of all capital, or in other words, the net profit. This is how the net profit actually increases the total capital or net worth and, hence, may properly be considered a fund provided, a case of funding *by the customers of a business;* they add to the net worth a contribution quite as real as that of an investor.
(2) The second funding operation is more readily understood because it is direct as, for example, the receipt of cash from the sale of shares of capital stock of a corporation, or in the case of a partnership or single proprietorship, the direct non-operating contribution of cash to the capital structure.
(3) Funding or defunding, or net worth changes, may also result from adjustments made to net worth whereby past earnings are either increased or decreased because of errors made in reporting previous years' earnings. Such adjustments might be required because of excessive depreciation charged in prior years (or vice-versa), or for over or underpaid income taxes of earlier years; these are plainly funding or defunding transactions which directly affect net worth.

EXAMPLES OF CONVERSION FUNDING

Conversion funding goes on every day but, for purposes of preparing Application of Funds Statements, cognizance of this type of funding is taken (as a rule) only once a year, although more frequent statements might prove to be very desirable and helpful. Examples of conversion funding follow.

(1) The conversion funding which usually appears as the second item in the "Funds Provided" section is most often labeled "Depreciation Currently Provided For" or by other similar words. Why I do not like that terminology will be discussed shortly.
(2) Funds provided from the sale of bonds or from some other debt-creating form, which will also be discussed shortly.
(3) Other transactions such as the amortization of bond discount and other long deferred charges; these find their way into the current operations of the period covered by the Application of Funds Statement; net worth or total capital are not affected thereby, except through the annual or periodic operating activities into which, like depreciation, they are fused.
(4) The decrease in Working Capital (when that occurs) is also a part of "Funds Provided" and shows, without dealing with its components, how and to what extent it had to be devo'ed for the various applications made of the current funds provided during the period covered.

A REVISION OF THE STATEMENT

In order to make the Application of Funds Statement quite clear, I propose the following form supported by the descriptive language shown:

Statement Showing the Derivation and Application of Funds for the Year ended December 31, 1955

Funds Were Provided as Follows:		
A. By operations which *directly increased* the net worth or total capital; these funding operations are expressed by:		
(1) the net profit for the year 1955, before income taxes		$100,000
(2) the sale of 1000 shares of Capital Stock, of a par value of $100 per share		100,000
B. By operations which did not affect capital but which tended to increase working capital; these were expressed through:		
(1) the utilization or conversion of plant values into current values as estimated by the charges for depreciation, as follows:		
On Buildings	$ 6,000	
On Machinery and Equipment	14,000	
		20,000
(2) the amortization of bond discount through its absorption in bond interest and expense		1,000
(3) the sale of five year debentures at par		100,000
(4) the utilization of working capital funds, indicated by the reduction of working capital, as a whole (as shown below), amounting to		20,000
Total Funds Provided		$341,000

Note: The "A" items or transactions are Funding operations.
The "B" items are Conversion Funding operations.

These Funds Were Applied:		
A. In defunding operations which reduced the total capital fund or net worth, through:		
(1) the payment of dividends		$ 7,000
(2) the provision made out of profits for federal income taxes for the current year 1955		20,000
B. To the acquisition of permanent assets out of working capital; these additions were:		
(1) Patent costing		$200,000
(2) improvements and additions to fixed assets:		
Mfg. building	$95,000	
Machinery and Equipment	19,000	114,000
Total Funds Applied		$341,000

The effect of the two types of funding operations on working capital, leading to a reduction thereof, is shown in the following schedule:

STATEMENT OF WORKING CAPITAL

December 31, 1954 and 1955

	1955	*1954*	*Increase*	*Decrease*	*Net Increase or (Decrease)*
Current Assets					
Cash	$50,000	$20,000	$30,000	$ —	$ 30,000
Accounts Receivable	30,000	25,000	5,000	—	5,000
Inventories	10,000	40,000	—	30,000	(30,000)
Total Current Assets	$90,000	$85,000	$35,000	$30,000	$ 5,000
Less: Current Liabilities					
Accounts Payable	$38,000	$30,000	$ 8,000	—	$ 8,000
Fed. Income Tax	20,000	8,000	12,000	—	12,000
Accruals	9,000	4,000	5,000	—	5,000
Total Current Liabilities	$67,000	$42,000	$25,000	—0—	$ 25,000
Working Capital, Current Assets less Current Liabilities	$23,000	$43,000	$10,000	$30,000	$(20,000)

NOTES ON WORKING CAPITAL

That part of working capital available for paying the current debts of the business increased to the extent of $35,000 during the year; there was an increase of that amount in cash and accounts receivable; of this amount, $30,000 represented the increase in cash, enough to pay all current liabilities. At the end of 1954 there was $45,000 of cash and receivables available

to pay $42,000 of current liabilities; of the $45,000, cash amounted to only $20,000.

Comments.

You can see that the business is in a more solvent position at December 31, 1955 than a year prior, even with a decrease in working capital. Also, you should note that most of the decrease in working capital for the year was in inventories, the last of the current assets to become cash and receivables. If most of the $10,000 of inventory on December 31, 1955 was in finished goods that would be advantageous, at least from a short-run solvency standpoint. An analysis of the ending inventories would be desirable.

Liabilities sometimes show an advantageous condition. Note, for example, that the provision for federal income taxes increased by $12,000; that obviously means a much larger net income for the year 1955 as compared with 1954.

If all these situations were to be incorporated in the Application of Funds Statement that could be done as follows:

(1) We could show that funds were provided:		
(a) through reduction of inventories	$30,000	
(b) through acquisition of values represented by the increase in Current Liabilities	25,000	
Total		$55,000
(2) The above provision of funds from working capital were applied through conversion processes:		
(a) to the increase in cash	$30,000	
(b) to the increase in receivables	5,000	
Total		$35,000

The difference ($20,000) shows the excess of Funds Provided by working capital over funds applied to working capital.

I am of the opinion that the submitted Application of Funds Statement with its explanatory language, plus any additional notes such as were appended, will help to give a better understanding of the nature and objectives of the Statement. In general, the form adheres quite faithfully to that originally promulgated by accountants. I can see no good reason to change that form.

SUMMARY

So there may be no misunderstanding of my thesis, I have—

(1) used the term "capital fund" to indicate the total net capital or resources available for the operation of a business;
(2) segregated this "capital fund" into its two component funds, namely "working capital fund" and "fixed capital fund";
(3) stated, therefore, that "capital funding" ordinarily occurs only from net profits and the addition of new capital;
(4) held that the internal operations of a business frequently involve the conversion of working capital into fixed capital and vice-versa; that these should be called "conversion funding" because they do not affect the "capital fund," but
(5) that all of these funding operations be aptly described in the Application of Funds Statement, so that the reader may clearly see how they affect working capital; finally, that the term "non-funding operations" is misleading and incorrect because these are clearly operations between the two component funds which make up the total capital fund of a business; they are funding operations, hence the term "conversion funding" is recommended.

THE RELATIVE IMPORTANCE OF FIXED ASSETS

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CERTAIN SIGNIFICANT CHANGES relative to the importance of fixed assets and depreciation and depletion have taken place in the financial structure and operation of large industrial corporations during the past eighteen years. A comparison of two studies made by the writer—one in 1937 (based on 1936 data) and the other in 1955 (1954 data)—discloses some interesting differences.

These studies were made independently of each other. The purpose of the first study completed almost two decades ago was to show the importance of fixed assets in the balance sheet of the industrial corporation. The present study was made to determine the changes that have occurred in the relative significance of fixed assets and depreciation and depletion, using the 1937 study as a base. The information for both studies was taken from Moody's *Manual of Investments—Industrial Securities*, one for the year 1936 and the other 1954.

An effort was made to select large representative corporations for the individual industrial groups. The first study was based on a sample of 194 corporations. The number in each of the 17 industrial groups varied from three to thirty-four. The second study was based on a smaller sample totaling 77 corporations. The number in each of the industrial groups varied from two to nine. Median percentages were used throughout both studies to measure relationships.

The corporations can be classified as either manufacturing or extractive, with the exception of the Publishing and Retail Trade groups. Although no attempt was made to match the particular companies in the selected industrial groups, most of the companies included in the 1955 study were also included in the 1937 sample. For example, the Chemical group in the recent study contained the E. I. DuPont de Nemours & Company, Parke, Davis & Company, McKesson & Robbins, Incorporated, and the Celanese Corporation of America. Three of these companies were studied in 1937.

Three tables are presented below to show the comparison of the two studies.

Net Fixed Assets to Total Assets

Table I shows that within the past two decades the relationship of net fixed assets to total assets for all 17 industrial groups has decreased from a median of 40.6 per cent to 31.2 per cent, or approximately 23 per cent. In 1936 fixed assets were more than 50 per cent of the total assets of six groups, compared with only two groups (Steel and Petroleum) in 1954. The table also indicates that of the 17 groups, only three (Automobiles and Trucks, Office Equipment, and Publishing) show increases in the percentage of net fixed assets to total assets. All of the other 14 groups show median decreases ranging from 2.0 in Shoe Manufacturing to 34.8 in Railway Equipment during the eighteen-year period.

Depreciation and Depletion to Gross Fixed Assets

Table II reveals that the percentage of annual depreciation and depletion charge to gross fixed assets has increased from a median of 3.9 per cent to 4.7 per cent, or

TABLE I

PERCENTAGE OF NET FIXED ASSETS TO TOTAL ASSETS

(17 Selected Industrial Groups)

	1936		*1954*		
	No. Firms in Group	*Per Cent (Median)*	*No. Firms in Group*	*Per Cent (Median)*	*Median Increase*
Agricult'l Impl's	5	28.3	5	22.7	5.6*
Automob's & Trucks	9	29.6	5	34.9	5.3
Building Supplies	14	53.8	5	31.3	22.5*
Chemicals	12	56.6	4	31.5	25.1*
Electrical Equip.	7	33.4	2	24.6	8.8*
Food Products	34	41.7	9	36.4	5.3*
Machinery & Tools	11	40.6	4	20.9	19.7*
Office Equipment	5	20.7	4	26.2	5.5
Paint & Materials	6	36.2	3	32.3	3.9*
Petroleum	11	60.7	5	57.4	3.3*
Publishing	4	23.3	3	33.5	10.2
Railway Equipment	10	66.0	5	31.2	34.8*
Retail Trade	32	43.6	7	22.9	20.7*
Shoes—Mfg.	3	21.4	3	19.4	2.0*
Steel	13	64.0	5	57.5	6.5*
Sugar	8	55.7	3	26.1	29.6*
Tobacco	10	19.6	5	5.8	13.8*
Total	194		77		
Median of Groups		40.6		31.2	

* Decrease.

TABLE II

PERCENTAGE OF ANNUAL DEPRECIATION AND DEPLETION TO GROSS FIXED ASSETS

(17 Selected Industrial Groups)

	1936		*1954*		
	No. Firms in Group	*Per Cent (Median)*	*No. Firms in Group*	*Per Cent (Median)*	*Median Increase*
Agricult'l Impl's	5	3.9	5	5.4	1.5
Automob's & Trucks	9	5.3	5	5.3	.0
Building Supplies	12	4.0	5	4.7	.7
Chemicals	10	4.0	4	4.3	.3
Electrical Equip.	7	4.2	2	6.5	2.3
Food Products	32	3.5	9	4.5	1.0
Machinery & Tools	10	3.9	4	6.7	2.8
Office Equipment	5	3.9	4	6.9	3.0
Paint & Materials	3	3.1	3	3.9	.8
Petroleum	11	4.7	5	5.1	.4
Publishing	4	3.7	3	3.4	.3*
Railway Equipment	8	3.3	5	4.0	.7
Retail Trade	31	4.6	7	5.2	.6
Shoes—Mfg.	3	3.9	3	6.0	2.1
Steel	13	2.3	5	3.7	1.4
Sugar	7	2.7	3	2.1	.6*
Tobacco	10	4.2	5	4.3	.1
Total	180		77		
Median of Groups		3.9		4.7	

* Decrease.

TABLE III

PERCENTAGE OF ANNUAL DEPRECIATION AND DEPLETION TO NET SALES

(17 Selected Industrial Groups)

	1936		*1954*		
	No. Firms in Group	*Per Cent (Median)*	*No. Firms in Group*	*Per Cent (Median)*	*Median Increase*
Agricult'l Impl's	5	4.0	5	2.1	1.9*
Automob's & Trucks	9	3.3	5	1.5	1.8*
Building Supplies	10	3.2	5	1.7	1.5*
Chemicals	7	5.4	4	1.1	4.3*
Electrical Equip.	2	4.3	2	2.0	2.3*
Food Products	12	4.6	9	1.0	3.6*
Machinery & Tools	3	3.5	4	1.5	2.0*
Office Equipment	3	2.0	4	2.4	.4
Paint & Materials	2	1.4	3	1.0	.4*
Petroleum	11	9.6	5	5.5	4.1*
Publishing	4	2.6	3	1.0	1.6*
Railway Equipment	3	5.8	5	1.7	4.1*
Retail Trade	32	2.2	7	.8	1.4*
Shoes—Mfg.	3	2.0	3	1.6	.4*
Steel	10	5.8	5	3.4	2.4*
Sugar	1	7.6	3	.8	6.8*
Tobacco	1	3.4	5	.4	3.0*
Total	118		77		
Median of Groups		3.5		1.5	

* Decrease.

approximately 20 per cent. Twelve of the 17 industrial groups had medians of 4.0 per cent and below in 1936; yet in 1954 only five industrial groups can be classified in this category. Only two groups (Publishing and Sugar) show decreases in 1954 as compared with 1936. The Automobile and Truck group shows no change during the period. The 14 remaining groups have median increases ranging from .1 in the Tobacco group to 3.0 in the Office Equipment group.

Depreciation and Depletion to Net Sales

Table III shows that the annual depreciation and depletion charge to net sales has decreased from a median of 3.5 per cent to 1.5 per cent, or approximately 57 per cent, during the 1936–1954 period. The depreciation and depletion charge in relation to net sales in 16 of the 17 industrial groups is less than it was eighteen years ago. These median decreases range from .4 to 6.8 among the 16 groups. The Office Equipment group shows the only median increase—a very slight one—in the amount of .4.

Depreciation and depletion are calculated on a fixed asset base generally carried on the books at an historical cost figure. The annual expense appearing in the current income statement is made up of accumulation of dollars with varying degrees of purchasing power, since fixed property may have been acquired over the past years at different price levels. On the other hand, the net sales figure contained in the income statement consists of the sum of current dollars recorded on the books during the particular year.

SUMMARY

The objective results obtained from this comparative study reveal that from 1936 to 1954 (a) the percentage of net fixed assets to total assets has decreased in relative importance; (b) the annual depreciation and depletion charge in relation to gross fixed assets has increased; and (c) the annual depreciation and depletion

charge as a percentage of net sales has decreased.

These phenomena perhaps have no general explanation because of the many variable factors which enter into the growth and changing relationship of the asset accounts. One outstanding reason which seems to account for the changes in fixed asset relationships is the increase in prices (decrease in the purchasing power of the dollar) during the time of the study. This is certainly not the sole explanation.

A relative increase in the amount of working capital and investments to total assets occurs as the percentage of net fixed assets to total assets decreases. Present credit restrictions and bank lending practices are different from those in 1936, and probably account for larger amounts of assets being tied up in receivables. The diversification of operations will have an inclination to increase inventories and receivables. Fund accounts, consisting of cash and marketable securities, established for pension and sinking funds, are being enlarged. Mergers and consolidations also have their effect on fixed asset relationships in the accounting records.

All of these factors and their relation to fixed asset accounts will shift from time to time depending upon the phase of the business cycle, the stability of the price structure, the degree of employment, and the stage of technology in our economy.

JOINT COST ANALYSIS AS AN AID TO MANAGEMENT—A REJOINDER

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IN his article in the October 1955 issue of this REVIEW, Professor Arthur N. Lorig has attempted to show how, in given circumstances, joint cost analysis can be an aid to management.

The model employed by Professor Lorig presupposes a situation wherein two products are produced jointly, originating from common materials. In the short run the ratio of the respective quantities produced is fixed and invariable.

Having made it clear that management will usually obtain as much control information from the total cost of the joint processing up to split-off point as it would from the same cost allocated between the joint products, Professor Lorig proceeds to outline a situation where joint cost analysis is an aid to management.

In this particular instance the joint costs of production are allocated between the joint products according to the value method; " . . . the ratio of the sales values of the several products is taken as the ratio for distributing the total cost of the joint process . . . ." Professor Lorig suggests that this is the only logical method to use whatever the conditions surrounding the joint production process. Implicit in this method is the assumption that every dollar invested in the production of the joint products is equally profitable. Whether or not one considers such an assumption logical, one cannot deny that it is highly arbitrary. How then can one rely upon figures which are derived from such an arbitrary basis? The element of arbitrariness having entered a calculation at the outset, it follows that the final answer will be arbitrary to some degree.

Further, let us assume that due to a change in the respective demands for the joint products, there is a change in the sales values. If the cost and volume of output have remained constant, then, by adhering to the value method of joint cost allocation, the same total costs of production will be divided differently over the same physical volume of production. Such a situation implies that the cost of a joint product depends upon the demand for that product. Is this a realistic assumption?[1]

In his illustration Professor Lorig assumes two products, A and B, having sales values of $4,000,000 and $8,000,000 respectively. The total cost of production is $7,200,000. In the first example the special processing costs after split-off are $1,500,000 and $2,500,000 respectively, whereas in the second example they are respectively $2,800,000 and $1,200,000. Using the value method, Professor Lorig allocates the joint costs as below.

Example 1

	A	*B*	*Total*
	(in thousands of dollars)		
Sales value	4,000	8,000	12,000
Gross profit (40%)	1,600	3,200	4,800
Total cost (allocated in proportion to sales values)	2,400	4,800	7,200
Special processing costs	1,500	2,500	4,000
Joint costs	900	2,300	3,200

[1] The discovery of a process facilitating the sole production of one of the products—hitherto considered joint—may also upset joint cost apportionments which are based upon the value method. If the production resulting from the new process is likely to increase supply greatly, there will be a decline in the market value of the product which can now be produced separately. Those producers who are still operating the joint process will, by using the value method, achieve the same result as above.

Example 2

	A	*B*	*Total*
	(in thousands of dollars)		
Sales value	4,000	8,000	12,000
Gross profit (40%)	1,600	3,200	4,800
Total cost (allocated in proportion to sales values)	2,400	4,800	7,200
Special processing costs	2,800	1,200	4,000
Joint costs	(400)	3,600	3,200

In both these examples the figures which are known are, (1) individual sales values; (2) individual special processing costs; (3) total joint costs; and (4) the total cost of the joint process. Thus, product total costs, product joint costs, and individual gross profits, having been calculated on an arbitrary basis must themselves be arbitrary. What aid does management obtain from these arbitrary figures? Both examples indicate gross profits of $1,600,000 and $3,200,000, respectively for A and B. Can we then say that the total profit of the joint process would decline by these respective amounts if either product were to be regarded as waste at split-off point? The answer to this question can be ascertained by making a comparison of the costs and revenues which would be forgone by regarding either product as waste at split-off point.

If, in the first example, product A was considered as waste at split-off, then, as indicated below, the decline in total profit would be to the extent of $2,500,000 and not $1,600,000 as shown by the value method. Should product B be regarded as waste (again example 1) the decline in total profit would be to the extent of $5,500,000 and not $3,200,000 as we are led to believe in Professor Lorig's calculation.

Professor Lorig's second example indicates the same gross profit figures, namely, a total gross profit of $4,800,000 and individual gross profits of $1,600,000 and $3,200,000 for A and B respectively. Because of the method of distribution it

(1) Example 1 (reconstructed)

	A	*B*	*Total*
	(in thousands of dollars)		
Sales value	4,000	8,000	12,000
Less special processing costs	1,500	2,500	4,000
Contribution to joint costs	2,500	5,500	8,000
Less joint costs			3,200
Gross profit			4,800

(2) Product A regarded as waste at split-off point (example 1)

	B
	(in thousands of dollars)
Sales value	8,000
Less special processing costs	2,500
	5,500
Less joint costs	3,200
Gross profit	2,300
Gross profit of joint process (both products saleable)	4,800
Gross profit where product A is regarded as waste at split-off point	2,300
Decline in gross profit	2,500

(3) Product B regarded as waste at split-off point (example 1)

	A
	(in thousands of dollars)
Sales value	4,000
Less special processing costs	1,500
	2,500
Less joint costs	3,200
Gross loss	700
Gross profit of joint process (both products saleable)	4,800
Gross loss where product B is regarded as waste at split-off point	700
Decline in gross profit	5,500

would seem that product B is now absorbing total joint costs in addition to $400,000 of the special processing costs of A. Lorig denies that this result indicates a flaw in the method of apportionment and argues to the effect that joint cost analysis has now become an aid to management.

According to Lorig the "throwing up" of a negative joint cost figure indicates that it would probably be more beneficial to management to discontinue the special processing of the product which shows the

negative figure. The capital which would be released by the discontinuance of such further processing could be more beneficially employed in the increased production of the seemingly more profitable product.

Before examining the conclusion which Professor Lorig derives from this latter calculation, let us first examine the figures which the value method here reveals. Given that one does accept a logical, though arbitrary basis for joint cost apportionment, the value method falls down completely in this second example. How can any logical person say that the total cost of a joint product is $2,400,000 when it is a fact that the special processing costs of this joint product, which are merely one element of total product cost, amount to $2,800,000? (This is the situation with regard to product A in Lorig's second example.)

Here again the value method causes misconception as to individual product profits. Without attempting to calculate respective product profits it can be noticed how total gross profit would be affected if either product were to be regarded as waste at split-off point. As shown below in the reconstruction of Professor Lorig's second example, the regarding of product A as waste would bring about a decline in total gross profit to the extent of $1,200,000, whereas if product B is regarded as waste a reduction of $6,800,000 in total gross profit will occur.

(4) Example 2 (reconstructed)

	A	*B*	*Total*
	(in thousands of dollars)		
Sales value	4,000	8,000	12,000
Less special processing costs	2,800	1,200	4,000
Contribution to joint costs	1,200	6,800	8,000
Less joint costs			3,200
Gross profit			4,800

(5) Product A regarded as waste at split-off point (example 2)

	B	
	(in thousands of dollars)	
Sales value	8,000	
Less special processing costs	1,200	
	6,800	
Less joint costs	3,200	
Gross profit	3,600	
Gross profit of joint process (both products saleable)		4,800
Gross profit where product A is regarded as waste at split-off point		3,600
Decline in gross profit		1,200

(6) Product B regarded as waste at split-off point (example 2)

	A	
	(in thousands of dollars)	
Sales value	4,000	
Less special processing costs	2,800	
	1,200	
Less joint costs	3,200	
Gross loss	2,000	
Gross profit of joint cost process (both products saleable)		4,800
Gross loss where product B is regarded as waste at split-off point		2,000
Decline in gross profit		6,800

From these latter three examples (referring to Professor Lorig's second example) it is evident that with existing capital, profits will be maximized in the short run if both products are subjected to further processing after split-off point.

Let us now return to the main argument in the thesis of Professor Lorig. According to him, a negative joint cost figure, as shown in his second example, would probably indicate a more beneficial use of resources. Discontinuing the further process of the product showing the negative joint cost figure is advocated by Lorig, the amount of capital here released being utilized in the increased production of the other product. What capital would be released? Lorig suggests, in effect, that it would be the special costs of processing

the product showing the negative figure. Lorig's treatment of joint cost analysis does not make it clear what expenditures enter into the cost of the joint product process. The distinction between short run and long run costs has not been elucidated, with the result that confusion as to the fixity or variability of the constituents of total cost is bound to arise.

In the short run certain expenditures (management, buildings and machines etc.) are fixed—their incurrence is compulsory whether or not economic activity is undertaken. On the other hand, there are some expenditures (labor, fuel, materials and power etc.) which, in the same period are variable with output. Once incurred, expenditures which are fixed over a certain period of time are irrelevant in calculating short run operation costs for decision making purposes. However, it is an accounting practice to include a proportion of such fixed expenditures in arriving at the short run cost of a given unit or product.

If Professor Lorig is adhering to this accounting convention in calculating the joint product costs, then, since these will include a fraction of expenditures which, in the short run are fixed, the capital released by discontinuing the special processing of A (second example) will not in fact amount to the figure which he suggests, but will be the total expenditures which in the short run vary with output, namely, labor, fuel, power and materials etc.

The inclusion of a proportion of fixed or overhead expenditures in short term cost calculations is merely an attempt to bring the long term into the short. The employment of such an accounting convention may prevent profit maximization. In the short run, optimum production is that which covers variable costs and makes the greatest contribution to overheads. Even though overheads are not covered in the long run, production which makes some contribution to them is worth while in that it helps to minimize losses. Thus, in any year where total costs (fixed costs plus variable costs) are already covered, a producer who refuses further production covering variable costs plus a surplus, on the grounds that variable costs plus a "fair apportionment of overheads" will not be covered on the further production, would not be maximizing profits.

The initial examination of Professor Lorig's joint cost analysis assumes that the costs which he uses in computing gross profits are those which are variable with output in the short run. If this is the case, regarding product A as waste at split-off point may in fact release capital to the extent of the special costs of A. Assuming that, as a result of circumstances illustrated by the second example, the special processing of product A has been terminated. Will it be economic policy to devote the released capital to the increased production of product B? The solution of such a problem depends upon (a) the conditions of demand for product B; and (b) whether there exists any surplus plant capacity for the further production of product B. Professor Lorig indicates that demand conditions for product B are such that an increase in production could be sold without any decline in the selling price of each unit. In such demand conditions the existence of surplus plant capacity is dependent upon the fact that such capacity can be utilized only in the production of units of output at a cost which would exceed the revenue accruing from these units of output. Capital released by discontinuing the special processing of product A would therefore be invested unprofitably if it were employed in the further production of product B in these circumstances.

Where short run capacity has reached its upper limit (due to favorable cost conditions and the demand schedule described above) an expansion of plant and machinery is necessary if a higher level of output is

to be achieved. Without doubt this may appear a very attractive proposition—provided current demand for product B is likely to endure for a sufficiently long period to recover the extra capital laid down plus an interest factor. Moreover, given that there is no possibility of a decline in the future demand for product B, there still remains a problem of economic choice. The expediency of transferring resources from less to more profitable lines of economic activity is unquestionable. The difficulty which arises in this particular case is of deciding which is the more profitable. In making this decision the producer must compare the profitability of an existing process, namely, the special processing of product A, with the expected profitability of the plant expansion required for producing a greater saleable volume of product B.

For such a comparison the apposite criteria are as follows:

(a) the cost of the new plant for the increased production of product B;
(b) the extra revenue which would accrue from the increased production of product B;
(c) the special costs of product A which would be saved by discontinuing the production of product A;
(d) the extra joint costs which would be incurred by the increased production of product B (if only one product is processed these costs are no longer common, but are the separate costs of product B);
(e) the extra special costs resulting from the increased production of product B;
(f) the decline in total revenue due to the ending of the special processing of product A.

Whereas the cost of a new machine is a present value, the other factors indicated above are all values in the future. To facilitate a direct comparison of these costs and revenues it is necessary to discount the future values. Discounting is the device employed in transforming sums in the future into their present values, and is merely a method of eliminating the time element without affecting the profit position.

In the above circumstances, if the cost of the new machine is less than the present value of the sum of (b) and (c) minus the present value of the sum of (d), (e) and (f), the purchase of the new machine will add more to total profit than will the special processing of product A with existing plant and machinery.

Should the special processing plant for product A have a scrap or second-hand value, this would enter the calculation as a deduction from the cost of the new machine—as would the present value of the future scrap value of the new machine itself.

This approach would indicate the more profitable of the two alternatives, but even though the purchase of the machine may appear more economic, a further consideration remains, namely, whether the resources released by discontinuing the special processing of product A are sufficiently great to proceed with the planned scale of investment.

If the producer is not confronted with limited capital, he would, assuming rational behavior accompanied by pecuniary motives, undertake investment on a scale conforming with expected future demand. But with unlimited capital it would not be necessary to cease the processing of product A at split-off point. In that product A makes some contribution to joint costs when sold, it is a profitable line of economic activity. Thus, where the production of product B had reached optimum —the point at which any further production is unprofitable—the producer could conceivably increase his total profit by increasing the saleable output of product A.

The analysis suggested above is dependent, as is most business behavior, upon estimates of the future. These estimates are essentially subjective to individual producers and such being the case, they are objectively indeterminate.

ABSTRACTS OF DISSERTATIONS IN ACCOUNTING FOR 1954 AND 1955

Collected by
SIDNEY DAVIDSON
Director of Research

THIS is a continuation of the presentation of abstracts of doctoral dissertations in accounting begun in the October, 1955 issue of the REVIEW. A second list appeared in the January, 1956 issue. The list of 1954 and 1955 dissertation abstracts will be completed in the October, 1956 issue of THE REVIEW.

The shorter of these abstracts naturally are only indicative of the problem explored by the author. Where the reader's interest is stirred by the abstract, further information about the particular study may be obtained from the author of the dissertation. Most of these theses have not been published in full. However, it is often possible to secure an unpublished thesis through inter-library loan. Also the university library usually can supply photostatic copies at a reasonable cost and perhaps microfilm reproductions at even lower costs. Of course, it is necessary to observe any copyright restrictions by getting the author's written consent before any material is released.

Anyone interested in any of these studies should write to the author, or to the library of the school where the dissertation was done.

EFFECT OF CHANGING PRICE LEVELS ON ACCOUNTING RECORDS AND RATIOS

Warren Asquith Howe
Ohio State University, 1954

During less than a quarter of a century, the value of a dollar has decreased approximately fifty per cent, creating an accounting problem. Records of a company in operation during that time would contain amounts reported in dollars varying in purchasing power from 100 per cent–50 per cent. Accountants recognize the need for stabilizing accounting values, but they disagree in the methods proposed for accomplishing it.

Many studies have been conducted along this line in which index numbers have been used in an attempt to eliminate from the records the effect of changes in the purchasing power of the monetary unit. The method of application of index numbers varies. Some accountants have adjusted all of the accounts by the use of index numbers. Others have adjusted only the fixed assets accounts. Some others have adjusted only the revenue and expense accounts.

This study differed from the previous studies in that it included a study of ratios as well as a study of absolute amounts. All of the accounts of an automotive company for a fourteen year period were converted to a common value by the application of the retail price index for all commodities prepared by the U. S. Department of Commerce, using 1935–39 to equal 100 per cent. A complete set of comparative statements was prepared.

Vast differences between the reported and the adjusted amounts were found. For example, in 1952, the reported net income was $6,084,000, which was reduced to $2,673,000 through adjustment. This was a reduction of more than 50 per cent.

The total assets reported in the same year were $120,068,000. After adjustment, the total assets were $60,903,000, approximately a 50 per cent reduction.

Management is interested in the current position of the firm as indicated by the working capital. In 1952, the reported value of current assets of $78,873,000 was reduced through adjustment to $37,327,000, making a decrease of $41,546,000, an amount which, on the surface, would be alarming to management.

It is interesting to note at this point, however, that the current liabilities, also, decreased through adjustment. The current liabilities reported for 1952 were $54,665,000. The adjusted current liabilities were $25,895,000. This made a decrease of $28,770,000, which was more than 50 per cent of the reported amount.

These examples are typical of what happened as the result of the adjustments. The conversion of the absolute amounts revealed that the differences between the reported amounts and the adjusted amounts were greater than the adjusted amounts themselves in many cases. This would seem to indicate that immediate steps should be taken to correct the situation.

This study is unique in that it goes further than the comparison of absolute amounts only. It includes ratios computed on the reported values which were compared to the respective ratios computed on the adjusted values. The comparison of the two sets of ratios revealed a striking similarity, indicating that both sides of the accounting equation were similarly influenced by inflation. The close correlation, which is surprising, perhaps, softens the impact of the alarming differences between the absolute amounts as reported and as adjusted.

Charts were prepared indicating a wide difference between the reported and the adjusted total monetary assets and a similar difference in total liabilities. The relationship of current assets to current liabilities is closely correlated. The same is true of the rate of return on common stock equity.

In conclusion, changing price levels caused the amounts in the accounting records of this company to be greatly overstated in terms of the base values. However, because inflation affected both sides of the accounting equation similarly, the ratios computed on the reported and on the adjusted amounts were closely correlated.

The significance of the effect of price level changes on the records of any organization can be determined only after a complete study of absolute amounts and of ratios before and after adjustment. In this case, it was found that the impact of the great differences in amount was offset, to a great degree, by the similarity of the ratios.

The traditional method of keeping accounting records, using historical cost, should be supplemented by statements adjusted for price level changes. Without augmenting the accounting records with these supplementary reports, a firm cannot evaluate scientifically the influence inflation has had upon its records.

A STUDY OF DIFFERENTIAL COSTS AS A BASIS FOR MANAGERIAL DECISIONS

Adrian Franklin Murph
University of Texas, 1955

Cost accounting records do not generally provide the type of cost information required for making managerial decisions. It is the purpose of this study to determine the extent to which differential costs, the cost of increasing production or services by one unit, are a valid basis for decisions concerning pricing, level of output, multiple products and distribution.

The measurement of differential costs can best by approached through a correlation analysis between output and total cost of production. The differential cost can then be determined by applying the

proper formula to the information obtained from the resulting cost function. These formulas will vary according to the type of line used to describe the relationship between cost and output. Empirical studies of this relationship have found that a straight line is satisfactory in most cases but a second degree function must be used in some cases. If expansion beyond the limits of present plant capacity is planned, the cost function for the expanded plant must be based on engineering estimates. Formulas based on the equations for first and second degree lines can be used to determine the break-even point directly from the information yielded by the cost function.

Differential costs are a valid basis for many decisions concerning pricing, level of output, or both. In the pricing of special contracts, differential and not average costs should be used as a basis for decision since any price greater than the differential cost will make a contribution to net profit. Formulas based on the cost functions may be used to analyze directly the effects of an increase or decrease in prices on profit. Where a second degree function is used to describe the relationship between cost and output, it is possible to determine the level of optimum output, that is, the level of output that will yield the greatest profit. If an expansion beyond the limits of present plant capacity is planned, the cost function of the present plant and the estimated cost function of the expanded plant can be analyzed to determine the advisability of such expansion.

The measurement of unit differential costs for multiple products must be approached in a more indirect fashion. It is necessary, in this case, to find some variable such as direct labor hours that correlates well with burden costs. The differential burden cost per direct labor hour may then be used as a basis for determining the differential burden cost per unit of each product. These unit differential costs provide a basis for analyzing the effects of price changes and for determining the advisability of adding new products or dropping old ones. Under certain conditions, break-even analysis for a multiple product concern can be approached through a correlation analysis between cost and the total sales value of output, or between profit and total units produced.

Differential costs also afford a valid basis for decisions as to whether to make or buy fixed assets and component parts. In the case of fixed assets, if the additional costs incurred in its construction are less than the purchase price, it is more economical to make it. In the case of component parts, a sound decision may be reached through the comparison of the profit function if the part is manufactured with the profit function if the part is purchased. Differential costs are, of course, an integral part of these functions. Differential costs are also useful in determining the price which may be paid for raw materials and still yield a profit on the sale of the finished product.

An analysis of the plant cost function is also useful in decisions concerning plant shutdown. This analysis will determine the volume of sales necessary to incur a loss equal to shutdown costs. If it is anticipated that a sales volume greater than this can be maintained, the plant should remain in operation. Otherwise, the plant should be shut down. This same type of analysis can be used in connection with abandonment decisions.

The splitting of distribution costs into their fixed and variable components requires the correlating of each of these costs with some related variable and using the resulting cost function as a basis for cost allocation. For example, office expenses may be expressed as a function of the number of invoice lines. This type of

analysis yields information as to the contribution margin of a product, territory, or department. This information is a sound basis for decisions concerning the expansion or contraction of distribution activities.

ACCOUNTING PERIOD THEORY AND ANALYSIS

Colin Park

The University of Chicago, 1955

An accounting period is the period selected for reporting the financial operations of a business. Traditionally, calendar accounting periods such as the year have been used because of their convenience for regular stockholder reports, income tax returns, etc. For these purposes, regular calendar-period reportings will continue to be necessary. But reports for management analysis ought not to be restricted to calendar periods since the time dimensions of producing, distributing, and financing operations are not necessarily dictated by the calendar. Therefore, the hypothesis advanced in this study is that if accounting analysis is based on operational rather than calendar time considerations, new kinds of financial figures for management use could be developed.

In searching for an approach to a realistic operating period theory for accountancy, some economic time-analysis notions such as the short-term period, the long-term period, and market period were reviewed. This led to consideration of the operating cycle as the basis for a more flexible accounting-period concept. The free-capital investment-disinvestment cycle is appropriate not only because of its relationship to a firm's economic fund flows, but because its adaptation is not upsetting to the accounting matrix. It fits into the methodology rather well, as experimentation with a detailed case study confirmed.

An operating cycle has been described as the average time intervening between the acquisition of materials and services entering the storing and producing process and the final cash realization usually by sale of end product. It has been suggested by the American Institute of Accountants that when an operating cycle is thought to be less than one year, the one-year accounting period criterion should be used. In this paper, however, the use of dominant rather than average cycles was proposed, and the Institute's one-year bias was rejected in favor of using operating-cycle criteria even when the calculated periods turned out to be less than twelve months. The phases of an operating cycle and a means of estimating their lengths, using recorded figures, are thought to be as follows: (1) Period of commitment of cash to acquire materials and services, and storage awaiting use; by conversion of raw materials turnover ratios to days, and by sampling analysis of the time lags from receipt of materials, etc., to payment dates. (2) Internal production period; by conversion of product-in-process turnover ratios to estimated days. (3) Finished product storage; by conversion of finished product turnover to days. (4) Sale (instantaneous) and collection period; by conversion of accounts receivable turnover to days. The aggregate days can then be reduced to the nearest number of months and this period used as the operating-cycle criterion for accounting purposes. Greater precision in the calculation is not a practical necessity. It would not provide increased reliability in the figures since accounting data are biased by human judgment and conservatism.

Applications of the concepts developed in this paper include the application for forecasting which introduced a worksheet for tracing and planning fund-flows involved in total company financial operations. A method of illustrating the effects of alternative conditions or assumptions is

shown. Other schematic applications deal with the cost of maintaining excess raw materials, cost impacts in stabilization of work force, determination of dividend size, and fund planning for meeting payrolls. In these and other studies, emphasis is placed on reflecting the financial details of management plans and expectations in current reports, thus providing a connecting link between present and forecasted data. A new tool for measurement of overall financial performance is illustrated: It is a measure of the indicated direction of shift in a given period of time, preferably an operating cycle, of working capital funds. This feature is made possible when funds statements are segregated into current and non-current elements, in relation to operating cycles. The magnitude of the figure obtained is less important than the direction of its movement, for the direction of movement is an indicator by which corporate boards of directors could trace management's adherence to, say, a financial retrenchment order, or to a restrained plant expansion program.

The underlying theory of double-entry accounting is that for every grouping of services there is an offsetting ownership or other equity, and the system is kept constantly in balance as asset valuations and reflected equities are altered through operating and other events. The methodology of accounting hinges on broad assumptions as to historically-recorded and going-concern valuations for legal form entities, and as to the income implications of matched expense and revenue figures for time intervals called accounting periods; with supplemental notions as to conservatism, consistency, objectivity, materiality, and expediency. Of all these aspects of accounting technique, the one which to the writer seems to have been questioned the least is the accounting-period concept. The accounting-period concept, fraught with the arbitrariness of calendar measurements, has in fact been neglected by theorists. In criticizing some of the shortcomings of existing accounting-period theory, an attempt is made to suggest both theoretical and technical improvements. The treatment is positive since every opportunity has been taken to supplement rather than to supplant present notions of time periods in accountancy.

As a practical matter, assuming that time intervals having operational dimensions can be developed, three combinations of historical and forecasted financial statements are possible: (1) Income, funds, and comparative position statements covering a calendar period (usually a year); the currentness of assets and liabilities depending primarily upon extant one-year period notions—this being the present practice. (2) Financial statements covering a year period, but asset-liability currentness determined by operating time criteria. (3) Financial statements covering a period of time having operational limits and having operating-time intervals as the bases for asset-liability currentness. The third alternative is a radical departure from a strict calendar-period basis. The second alternative is an effective compromise and was the basis for the case study that accompanies this paper. The findings suggest that a door has been opened to a relatively untouched realm of accountancy. And the accounting period concept is one that should receive continuing attention from thoughtful accountants.

THE PROPRIETARY THEORY AND THE ENTITY THEORY OF CORPORATE ENTERPRISE

Arthur T. Roberts
Louisiana State University, 1955

Today there are two theories attempting to explain ownership of the corporation, the proprietary theory and the entity theory. There are numerous conflicting

ideas about the meanings of these theories. This dissertation attempts to determine what is meant by each of these.

The problem was approached by studying the proprietary theory and the entity theory of corporate enterprise as presented by writers in fields of law, taxes, investments, management, economics, and accounting, and by analyzing the position of stockholders, creditors, managers, employees, and government under the proprietary and entity theories of corporations.

Two theories pertaining to the granting of authority to the corporation are recognized in law. The association theorists hold that the stockholders associated together transfer to the corporation the rights necessary to carry on the business. This is a proprietary theory approach to corporate theory. The fiction theorists state that the state gives the necessary authority to the corporation as an impersonal being to carry on business activity. In so doing the state does not recognize what already exists, as proprietary theorists hold, but, following the entity theory, the state creates a new being separate and distinct from its stockholders and other interested parties.

In the field of taxation, one finds a common dispute among authors. The proprietary theorists claim there is a double tax on corporate and stockholders' income because both stockholders and corporations are taxed on the same income. The entity theorists claim there is no double tax because the income tax is levied on the corporation as a separate and distinct being from the stockholders and other interested parties.

In investments some authors speak of stockholders as merely investors and not as owners of the corporation. When the stockholders take a passive attitude and do not participate in corporate matters, following the entity theory, they act like creditors. Although the stockholder may not exercise his rights in the corporation, this is no reason for saying the rights do not exist or that he is not the owner of the corporation, according to the proprietary theory.

Management plays an important role in the corporate enterprise. Although management performs the function of managing corporate affairs, with authority delegated by the stockholders, some consider management as an entity in itself rather than an employee of the stockholders. The part owners previously played in the corporation has been taken over by management. Therefore, the divorce of ownership and control seems to indicate the entity theory or a managerial approach to corporate enterprise theory.

Economists usually take a broad view of the corporate enterprise because they consider the corporation in relation to the whole economy. Some economists hold that there is little difference between the interested parties (stockholders and creditors). In so doing they seem to follow an entity approach. However, there are other economists who follow the proprietary theory because they make a marked distinction between the stockholders and creditors.

The accountant must decide whether to follow a proprietary approach or an entity approach when accounting for corporate transactions. The proprietary theory is a stockholders' approach and the formula $A-L=C$ is appropriate because it demonstrates the stockholders as the residual claimants. The entity theory is a managerial approach and the formula $A=(L+C)$ is appropriate because it demonstrates the oneness of the unit and shows the obligations to all claimants together.

There are many conflicting ideas among authors in various fields regarding the proprietary and entity theories. A great deal of benefit could be gained if a more

uniform approach to the ownership problem of the corporation was followed by theorists in law, taxes, investments, management, economics, and accounting.

THE DEVELOPMENT OF A GENERAL QUASI-REORGANIZATION CONCEPT

James S. Schindler
University of Michigan, 1955

This dissertation is a study of a procedure, entitled a "quasi-reorganization," whereby a continuing enterprise could establish a new basis of accountability for its financial statements without formal court proceedings or creation of a new legal entity. The significance of the study arises from an increased recognition of the limitations inherent in current generally accepted accounting principles and the need to consider alternative proposals to provide flexibility rather than a rigid adherence to an historical cost basis. The purposes of the study are: (1) to develop a general quasi-reorganization concept for all conditions which might lead to a change in basis of accountability; (2) to present alternative standards and procedures and to indicate those most consistent with the general concept; (3) to provide an adequate basis for interested parties to appraise the relative advantages and limitations of the concept as well as the inherent problems in effecting it.

A review of the accounting literature and corporate statements related to the write-up movement of the 1920's and the write-down movement of the 1930's provided an historical perspective of the objectionable reporting in these periods and a basis for the proposal of improved procedures. The development of a limited quasi-reorganization procedure by the American Institute of Accountants and the Securities and Exchange Commission, likewise, was discussed as an antecedent of the general concept.

The development of the general concept and the related standards and procedures was divided into asset and equity phases. The subsequent determination of income was included within the discussion of the equity accounts. The presentation of asset accounts included the following: a definition of an asset for accounting purposes; alternative value concepts; a proposed value concept; valuation procedures to implement the value concept; the resources to be revalued; the specific asset restatements; and adequate disclosures. The presentation of equity accounts included the following: the nature and significance of equity representations; existing authoritative equity reporting principles; corporation code provisions; income tax laws; requirement of stockholder consent; accounting for subsequent transactions with equity holders; and disclosures in financial reports.

It was proposed that an "investment accountability" be established for all values entrusted to management. This required determination of total enterprise value. An "income accountability" would be attained by valuation of specific assets in accordance with a "going-concern replacement cost basis" which would provide for consistent subsequent income determination as well as comparability with the reporting of competitors. A resulting differential valuation would be recognized and amortized against income. It was proposed that all creditor and stockholder interests be valued and classified as contributed capital. A new dated retained income account would be initiated. Subsequent interest charges and income taxes would be computed consistently with the restated asset and equity accounts.

The proposed general concept is a composite of a group of standards encompass-

ing a complete change in basis of accountability. Even though the general concept may not attain widespread acceptability for application in its entirety, it provides a basis for judgment of the significance of alternative procedures. Further, the concept is deemed to have significance in other areas wherein a revised basis of accountability is proposed. The writer concludes that procedures based upon the general quasi-reorganization concept would elicit widespread agreement among interested parties and become eligible for admittance to the body of generally accepted accounting principles.

CONCEPTS AND MEASUREMENTS OF BUSINESS INCOME: ECONOMICS AND ACCOUNTING

Tsun Chen

University of Michigan, 1956

What is "business income"? How should it be measured? These problems have been constantly discussed by both accountants and economists, yet no close agreement has ever been reached. This is not so much because the two groups are inherently irreconcilable, but rather that they have never tried to understand each other. The present study is intended to provide a bridge between the two points of view, as mutual understanding will benefit the future development of both fields.

In this study, accounting concepts and measurement of business income are first presented in general terms; and then economic concepts and measurement of business income are similarly formulated. From this analysis, we find that in accounting, business income was originally viewed as the increase in net worth of proprietors and was measured mainly through the balance sheet; but now it is generally conceived as the residual from matching revenue and expenses, measured mainly through the income statement. It is a money concept, calculated periodically for a specific firm. "Objectivity" and "accuracy" are specifically emphasized. Most conventions and doctrines are introduced to meet this standard. The resulting income is thus made very definite and certain.

In economics, business income, from the mercantilists through Alfred Marshall, was usually conceived as the difference between gross revenue and expenses needed to maintain fixed and circulating capital intact. This was basically an income statement point of view, adequate for a static situation. But now most economists agree with Hicks that business income should be viewed more broadly as the maximum amount which a firm can distribute as dividends and still be as well off at the end of the period as at the beginning. Emphasis is thus shifted to the valuation of the balance sheet; moreover, the role of "expectation" takes on crucial importance. The resulting income cannot be "objective" and "definite" but must be "subjective" and "tentative."

From this separate analysis we find that there are, at least, three basic issues which differentiate the one concept from the other.

1. There is the problem, brought about particularly by changes in business prospects, of accretion versus realization as the criterion for income recognition. In seeking "objectivity" and "certainty" accountants follow religiously the rule of realization evidenced by a sale. In emphasizing "relevancy" and "logic" economists argue constantly for the criterion of accretion, ascertained through periodic revaluation, and think that effective sale is not necessary for income recognition.

2. There is the problem of inclusion versus exclusion of unexpected gain. Such a problem arises from changes in expecta-

tions. We find that this issue is mainly one of income *ex ante* versus income *ex post*. If the former is used, there will be no unexpected gain. If the latter is applied, unexpected gain will naturally appear.

3. As a result of changes in the value of money, there is the problem of money income versus real income. In an economy where the price level remains stable, accounting income expressed in money terms will agree with economic income expressed in real terms. In an economy where the price level rises or falls, both will diverge theoretically and practically.

Finally, the various income concepts developed in this study are tested briefly against some practical problems of income measurement as seen by owners of capital, management, students of taxation, and students of national income. We find that the choice of income concept must depend upon the use to which it is put. There is no ideal concept which can satisfy all circumstances. In the middle of conflicting interests, the role of the accountant is to adopt multiple income concepts and prepare various financial statements for various interests with, however, the present accounting system as a starting point. Herein lies the challenge to the accounting profession.

A THEORY OF TAXABLE INCOME

Richard L. Williamson
Indiana University, 1955

To the person untrained in tax accounting and tax law, there may seem to be no problem in defining income. People are likely to think of something related to their own experience where they have little difficulty in deciding what income should be, and it may seem to them that the problem in tax accounting is the determination of what the taxpayer can deduct in arriving at taxable income. This study advances the proposition that the problem, rather, is the determination of income and that the handling of deductions is an acquired technique in the use of the statutes, regulations, and the interpretive tax services.

The determination of income is a problem because a clear and usable definition of taxable income does not exist. The Supreme Court, which is the only institution under the American constitution which can define income, has rejected the efforts of economists and accountants in defining income, and has attempted to build its own definition in terms of legal precedent. Beginning with the case of *Eisner* v. *Macomber*[1] in 1920 the Supreme Court tried to construct a definition around the concept of realization: the idea that the taxpayer must have "something coming in" in order to have taxable income.

But as the courts wrestled with the problem of applying the concept of realization to specific cases, they gradually expanded the concept, thus developing subsidiary principles under the main concept. In fact, social justice seemed to require the inclusion of some things as income which might not be so considered in accounting or law: the concept of realization was stretched quite beyond its original meaning. Following the principle of realization, various legal writers in law attempted to put this maze of decisions into an organized rationale, but they found it difficult to delineate an integrated system, useful and predictive, and they found it impossible to fit all of the cases into their respective systems: all were faced with conceptual limitations or exceptions.

This study advances the idea that realization should rather be considered as made up of three coordinate and cardinal principles, viz., the taxpayer must receive something, the taxpayer must yield something, and the thing the taxpayer re-

[1] 252 U. S. 189 (1920).

ceives must be in exchange for the thing he yields. The courts have nowhere mentioned these three principles, but the principles can be interpolated from the reasoning in many cases. The bare outline of the three principles is not sufficient, for the principles must be explained and applied to specific cases. What appear to be the leading cases are examined to find the subsidiary principles which arise as the explanations and applications are made.

Attention is directed to a consideration of what it means to receive something. It is found that the "something" may be intangible as well as tangible, while the "action of receiving" may constitute actual, constructive, and imputed receipt to the cash basis taxpayer, and the right to receive may constitute receipt to the accrual basis taxpayer. The "something" yielded may be intangible things, such as rights, as well as tangible things like capital and labor; the nature of yielding may be performance, surrendering of use, disposal by exchange or reorganization, etc. Intent is the chief determinant of whether the thing yielded is in exchange for the thing received and an investigation is made of the various indicia of intent.

Finally, an attempt is made to coordinate all of the subordinate principles and subsume them under the three major principles as an outline or theory of taxable income. It is believed that this forms a somewhat more consistent frame of reference and that it leaves fewer doubtful and difficult cases which do not fit into the rationale. It is believed, also, that this theory forms the basis of an administratively usable and predictive system.

NON-LINEAR DEPRECIATION

LEWIS A. CARMAN

THE depreciation of a physical asset is its decline in value by the action of deleterious or adverse factors. These generally are wear-and-tear, the elements, neglect, and so on, but may also include obsolescence and other nonphysical factors.

PART I—GENERAL SURVEY

110—Depreciation as function of time

With normal care an asset is good for a reasonably definite number of units of effective use. A particular automobile, for example, may be expected to run a certain number of miles under stated conditions. And it will be found that, on the average, a given asset constantly used under normal conditions will exhaust its deliverable units of effective use in a fairly definite length of time. Consequently it is often convenient to employ time as the measure of use even though it may not be completely logical to do so. For one thing, it is not then necessary to keep detailed records of expended units of use (miles, hours, etc.). If the date of manufacture or acquisition of the asset is known, a reasonable estimate of the remaining use can be made. Thus the value of a used automobile is commonly determined by its year of manufacture. The odometer reading might also be considered, but odometers can be reset whereas the age of the car cannot be disguised.

Accordingly it is possible to speak of the "useful life" of a physical asset and for accounting purposes to write off the cost of the asset in some systematic manner over this useful life. Like the life expectancy of a human being, the estimated useful life of a physical asset is derived from experience. It represents, therefore, a probability and not a certainty. The useful life is not necessarily the absolute life, for by means of repairs and replacements an asset may be kept serviceable for an indefinite time. Such maintenance eventually becomes unduly costly and the useful life is the much shorter estimated economic life.

The basic problem of accounting for depreciation is the selection of the "systematic manner" in which the cost (or other value) of the asset is to be written off over its useful life. The (recorded) value of the asset declines from its initial value at the beginning of its useful life to a terminal value at the end thereof. This terminal value may be either zero or a residual value commonly termed the "scrap value." The problem is to state the residual or depreciated value of the asset at any selected point during its life.

The asset has value at all times during its life. Consequently the value of the asset is *continuous*. The residual value declines as time increases. Therefore any formulation by which the residual value may be expressed will reflect a *negative* slope. The depreciated value of an asset is commonly expressed, then, as a continuous function of time with a negative slope.

120—FUNCTIONS

121—Types

There are two general types of continuous functions available for depreciation computations, the rectilinear (or straight line) and the curvilinear. The former is represented by a first degree or linear equation and hereafter will be termed simply a linear function. Mathematically a straight line is only a special case of a curve (i.e., one with zero curvature). Consequently curvilinear functions are the general type and comprise all non-linear forms. They include a wide variety of types and many types in turn include

whole families of curves. There is, therefore, an infinite number of curves available for depreciation computations. Some of these, however, are extremely complex, difficult to compute, and are utterly impractical for use. Others are simple and are relatively easy to compute. Generally speaking, the simpler the curve the better it is for depreciation purposes.

Now equations involving linear or straight line functions may be computed by arithmetic whereas curvilinear functions must be expressed algebraically. The actual computation of a curve from an algebraic equation may require only arithmetical operations, but the fact that the formulation thereof requires an elementary knowledge of mathematical analysis (i.e., algebra, analytic geometry, and the calculus) has placed curvilinear depreciation schemes beyond the reach of accountants. This is a pity for the simpler curves require only the algebra commonly taught to 13 or 14 year old high school pupils and the mathematical analysis is that encountered in the first semester of the freshman year of college and is usually mastered by students 17 or 18 years of age.

Accountants earn their living by dealing in figures, but that does not make them mathematicians—not by a long shot. Accounting bears about the same relation to mathematics that plumbing does to architecture—a useful but restricted craft in a very large field. Rarely do accountants have occasion to use anything beyond eighth grade arithmetic and the vast majority of them lack the knowledge of anything higher. Actually accountants have little more use for mathematics than they do for physics and chemistry. And although these could, on occasion, prove useful (mathematics in handling the rare problem not resolvable by arithmetic, and physics and chemistry in the understanding of manufacturing processes) the probable utility of these subjects does not warrant their inclusion in accounting curricula.

Ignorance, therefore, of such a specialized subject as mathematics is not in itself reprehensible. One of the marks of an educated man is his ability to recognize the limits of his own knowledge and to know where to repair for information or skills beyond those limits. But ignorance of one's own ignorance engenders a bumptious presumption and of this, to judge by published matter, a number of accountants have been guilty. Some of their attempts to resolve the difficulties of curvilinear depreciation have been so ludicrously naïve as to be both comic and pathetic. The simple truth is that accountants have yet to produce a true curvilinear depreciation scheme and the reason for this failure is the fact that they completely lack the requisite mathematical knowledge. The best they have been able to do is to concoct several clumsy approximations and even these they have been unable to control.

Now there is a vast difference between the design and manufacture of a mechanism and its use. Few automobile drivers could either design or make the cars they drive with such ease. And is it unlikely that any typist could design or make a typewriter or a pianist a piano. Similarly, individuals who lack the mathematical knowledge necessary to formulate a curvilinear depreciation scheme nevertheless may readily use an already formulated scheme merely by substituting values for the variables therein. It is well known that the circumference of a circle is 3.14159265 times its diameter, or $C = 3.14159265D$. With this formula the circumference of a circle of any given diameter may be computed even by those unable themselves to derive the ratio 3.14159265.

The facts of curvilinear depreciation will be formulated herein in such a manner that anyone desirous of utilizing such a

scheme for the computation of depreciation need only substitute the basic data of the problem in a formula. Proofs of the formulations will not be given as these would require considerable space, would be unnecessary to those having a knowledge of elementary mathematical analysis, and would be incomprehensible to those without it.

122—Linear

Although linear depreciation is simple to compute, for it requires only arithmetic, it is not always factual. For example, the resale values of a well-known automobile expressed as fractions of its original value at intervals of one year are charted in Figure 11:

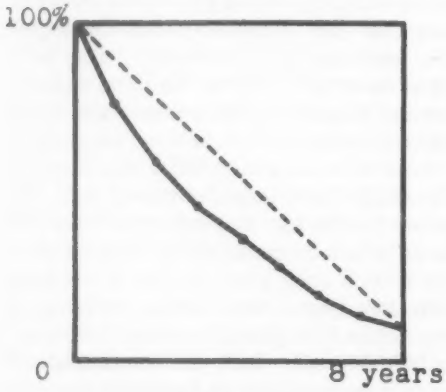


FIG. 11

The charted values for the eight years are those given by a market report published for automobile dealers. Quite obviously the linear scheme, represented by the dotted line, is far from factual.

123—Segmented

Confronted with the manifest inadequacy of linear depreciation and lacking the mathematical knowledge to compute curvilinear depreciation, accountants have been thrown back hard on their haunches. With only eighth grade arithmetic to guide them, they have concocted several bastard schemes, at least two of which are in use. These may be termed segmented schemes for they consist of a series of connected segments of straight lines. These segments —being linear—may be computed by arithmetic and in general form they approach a curvilinear scheme. These three types of depreciation schemes, linear, segmented, and curvilinear, are shown in Figure 12; each type is shown both with and without terminal residual values ("scrap values").

As stated above, segmented schemes are complex linear schemes for they are represented by a number of separate straight lines. The effect, however, is that of a crude curve. If the segmented scheme is based on a more or less general relationship it will approach a curve as the number of segments in the life is indefinitely increased, just as regular polygons approach circles as the number of sides is increased. This limiting curve is always simpler than the segmented scheme itself.

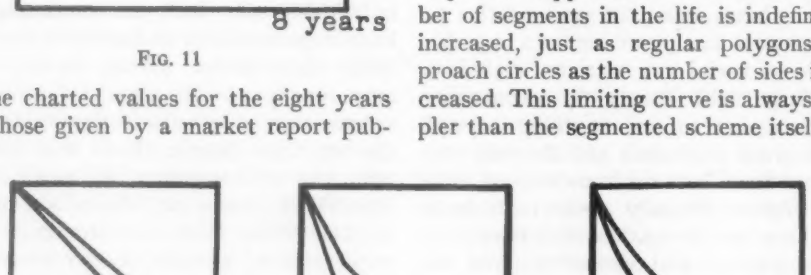


FIG. 12

124—Curvilinear

Curvilinear schemes may be compound (with points of inflection) or simple (without such points), and the latter may be either "concave-upward" or "concave-downward." These are illustrated in Figure 13.

FIG. 13

Only simple concave-upward curves and their segmented counterparts will be considered herein. The slopes of such curves (which are related to the depreciation rates) are greater than those of corresponding linear schemes at the beginning of the life of the asset and are less than the linear slopes (or rates) at the end of the life.

The slope of a straight line is defined as the vertical distance between any two selected points on the line divided by the horizontal distance between the same two points; it is therefore a ratio. The slope of a curve at a given point is the slope of the straight line tangent to the curve at that point. In the conventional form of mathematical graphs lines sloping upward to the right have positive slopes while those sloping downward to the right have negative slopes. The slopes of all depreciation lines and curves are negative for the residual (depreciated) value of the asset decreases as time increases.

The slope of a depreciation curve is a generalized equivalent of the depreciation rate. Now annual rates may be variously expressed. For example, an asset having a 20-year life will have an annual depreciation rate of 5%, one having a 10-year life will have a 10% rate, one with a 4-year life 25%, and so on. When charted, however, these annual rates will all be expressed by straight lines having a slope of −1. This simply means that the asset is fully depreciated at the end of its life, no matter how that life is expressed in years.

An asset with a scrap value will have a different slope. The slope of a curve at any point may be regarded as a multiple of the linear slope and as this in turn, for any given case, corresponds to an annual depreciation percentage, it is a simple matter to correlate the two. For example, in the case of an asset having a 20-year life and a 10% scrap value, the linear slope is −.9 and the annual linear depreciation percentage is 4.5%. If the slope of the curve at some point is −1.08, the corresponding annual depreciation rate (percentage) is

$$\frac{-1.08}{-.9}\times 4.5\% \text{ or } 5.4\%$$

Or, to arrive at it another way, multiply the slope by

$$\frac{4.5\%}{-.9} \text{ or } -5\%$$

Thus, $-1.08\times -5\% = 5.4\%$. Expressing the depreciation rate as the slope of the depreciation curve is a mathematical generalization that is infinitely more convenient for computational purposes than is the conventional practice of stating it as an annual percentage. Both the curve and its slope are then independent of the number of periods into which the life of the asset may be divided.

130—THE BASIC PROBLEM

131—The Problem Defined

The basic problem of curvilinear depreciation, then, is to pass a concave upward curve between two points, the whole

value of the asset at the beginning of its life and the terminal residual value at the end of its life. The problem may be generalized by taking the whole value of the asset and the whole life as unity (1.0). The residual value at any point during the life of the asset is then expressed as a fraction of the whole value and the elapsed time is expressed as a fraction of the whole life instead of as a number of years or months. Thus, in the case of an asset having a useful life of 8 years, the elapsed time at the end of the fifth year would be expressed as .625. This use of unity (1.0) to express both the whole value and the whole life permits comparisons to be made and curves to be formulated that are the same in character for all assets even though the number of years in their lives may vary widely.

The basic symbols to be employed are the following:

x = elapsed time expressed as a fraction of the whole life (1.0).
y = residual value of asset at any point of time expressed as a fraction of the whole value (1.0).
z = slope of curve at any point of time.

The following symbols represent particular cases of the foregoing:

v = terminal residual (or scrap) value at the end of the life (when $x=1$), expressed as a fraction of the whole value (1.0).
a = initial slope of curve (or z when $x=0$).
t = terminal slope of curve (or z when $x=1$).

Certain other symbols will be defined as they are introduced.

The relation of these symbols to one another is shown in Figure 14.

For any point (x) of the life, the equations will give the residual value (y) and the slope (z) of the depreciation curve. These same conventions apply to all the accompanying graphs but in order to save useless repetition are not expressed.

The problem, then, is to pass a concave-upward curve between the points (0, 1) and (1, v). A point is described by writing first the abscissa (horizontal distance from the origin) and then the ordinate (vertical

FIG. 14

distance) in parentheses with a comma between. Now v may equal zero or any number between zero and +1. If $v=0$, the curve will pass through the point (1, 0). Mathematically the problem is about as simple as shooting goldfish in a bowl. It is as easy, mathematically speaking, to express the equation for a straight line between two points as it is to draw the line on paper with a straight-edge. Not only that, but it is as easy to express mathematically the equation for a given type of curve that will pass through two selected points in a plane as it is to draw such a line on paper with the aid of a curved ruler (a "ship section" or so-called "French curve"). There is just nothing to it—yet the problem has long baffled accountants.

Perhaps too much attention has been given in accounting to the "scrap value" or terminal residual (depreciated) value. The "scrap value" concept is a theoretical and academic one widely encountered in schools but comparatively rarely in practice. It has little practical utility. The life of an asset is purely an estimate and consequently the annual depreciation is likewise an estimate. To introduce another estimate, the "scrap" or terminal residual value into the picture confuses rather than helps. Many worn-out items of equipment

are simply thrown on a scrap pile and are sold by the pound at irregular intervals. The amount realized is not identifiable with particular assets. Therefore it is much simpler to amortize the whole original value over the estimated useful life of the asset and to record any realization of scrap as an item of miscellaneous income. Ordinarily the value of equipment scrap is small in relation to the original value of the assets and there is little practical use in considering it in computing depreciation amounts. As a matter of fact it is widely disregarded in practice, even with automobiles which have relatively short lives and considerable trade-in (residual) values. However, in order to generalize the problem, consideration will be given herein to terminal residual values. If these are not desired, the equations can be simplified by substituting zero for v.

132—Relation of Mathematics to Depreciation

In the foregoing sub-section it was stated that the basic accounting problem with respect to depreciation is to pass a concave-upward curve between two points representing the initial and terminal values of an asset. A fair question is: what is the theory underlying depreciation schemes and by what sort of curve is this theory expressed mathematically? The simple fact is that there is no depreciation theory and mathematics has nothing whatever to do with any principle of depreciation, for there is none. Mathematics is merely a computing tool, a means of interpolation between the initial and terminal values. Just as one may draw a better circle with the help of a compass than without it, so one can produce a better interpolation curve with the aid of mathematics than without it.

The subject of depreciation, like that of life insurance, is based solidly on experience. Each type of asset under stated conditions of use has a more or less definite life expectancy. The results to be expected from the asset therefore are derived from factual data and not from theory. Actually, the best method of expressing the depreciation of a given type of asset is to chart on co-ordinate paper all the known data relating to it and to draw a smooth curve through or near the charted points. This curve may be drawn freehand, by mechanical means, or by a mathematical equation. In Figure 11 the plotted data relating to the resale value of an automobile are connected by straight lines; the result is a segmented presentation. A smooth curve fitted to the data would be far superior. (See Figure 38.)

A curve sometimes tends to correct observational errors, either instrumental or subjective. An astronomer who plots the course of a newly discovered comet generally finds that the plotted points lie close to but not exactly on a smooth curve. Obviously, the irregularities are those of observation and not of fact. With a large enough body of data available he can fit a curve thereto that will almost certainly present the actual course of the comet. At best depreciation data are only enlightened estimates and curvilinear interpolation smooths out irregularities.

A curve is self-consistent and systematic in its changes of slope and may be regarded as the ideal about which the factual data tend to group themselves. Many natural phenomena tend to follow mathematical curves, though no given set of data will fall exactly on a computed curve. The growth of biological cultures follows an exponential curve. Many magnitudes —from the size of seashells to the heights and weights of men—follow what is known as the probability curve. If five dice are thrown it is evident that the readings will vary from a minimum of five to a maximum of 30. Some results are more probable than others and the probabilities can be

computed. The computed results will be found to lie on a smooth probability curve. If the dice are thrown a large number of times and if the results are recorded, it will be found that they will tend to follow closely the computed probabilities. They will not hit them exactly with any finite number of throws, but the accordance is inescapable.

It is legitimate, then, to regard a mathematically computed depreciation curve as a systematic and self-consistent representation of factual data—*provided it is derived from those data*. Mathematics is a tool, and only a tool, for obtaining computed results or for succintly expressing intricate relationships. Applied to data derived from experience it produces answers consonant with fact. But the results are valid only to the degree that the data are valid. Mathematics by itself proves nothing with respect to depreciation. But accountants, being unversed in mathematics, tend to regard the unknown with almost superstitious reverence. They seem to mistake the tool for some sort of cabalistic revelation and to look upon depreciation formulas as though they were straight out of the joss house.

133—Selection of Curve

The question then arises: what type of concave-upward curve should be selected for depreciation purposes? From a purely mathematical standpoint it hardly makes any difference. While it is unwise to make sweeping mathematical generalizations, it may be said that almost any curve may be modified so that a segment of it will satisfy the conditions of a given problem. If the curve is not concave-upward in its simplest or most typical form it may be modified until it is. Although every curve is different from any other curve, segments of any two curves can be modified for a limited range until for all practical purposes they coincide.

This matter of modification has never been understood by accountants for otherwise they would have resolved most of their difficulties. To illustrate, some elementary modifications are shown in Figure 15.

Diagram (a) in this figure starts with the simplest of all curves, a parabola having its vertex at the origin of co-ordinates. In (b) the curve is reversed, in (c) the reversed curve is multiplied by $\frac{1}{2}$, in (d) the reversed multiplied curve is shifted one unit upward and two to the right, in (e) the reversed, multiplied curve is rotated 45°, and in (f) the curve is both rotated and shifted as in (d).

By suitable modifications a curve can be passed through selected points, be made tangent to selected lines, and have selected slopes at chosen points. In fact a curve can be made to do almost anything except bring one his breakfast in bed. It may be thought of as similar to a piece of wire that may be bent at will and placed as desired on a plane surface. That is not quite true, for a curve represented by an equation will maintain definite relationships between its points whereas a manually bent piece of wire will not. Yet limited segments of entirely different types of curves can be made practically indistinguishable.

In the illustrations given above the multiplicative and additive (shifting) operations were performed by constants, but it is also possible to employ other functions of x as modifiers instead of constants. Lest it be thought that modification is an unjustified tampering with the purity and sanctity of a curve, it may be stated categorically that there is no such thing as an "unmodified" curve—or, for that matter, anything else of a quantitative nature. When it is said that no apples, an apple, or four apples are on the table, the concept "apple" is multiplied by zero, one, or four. The numbers 0 and 1 are as real as are any other numbers. Multiplication by them is

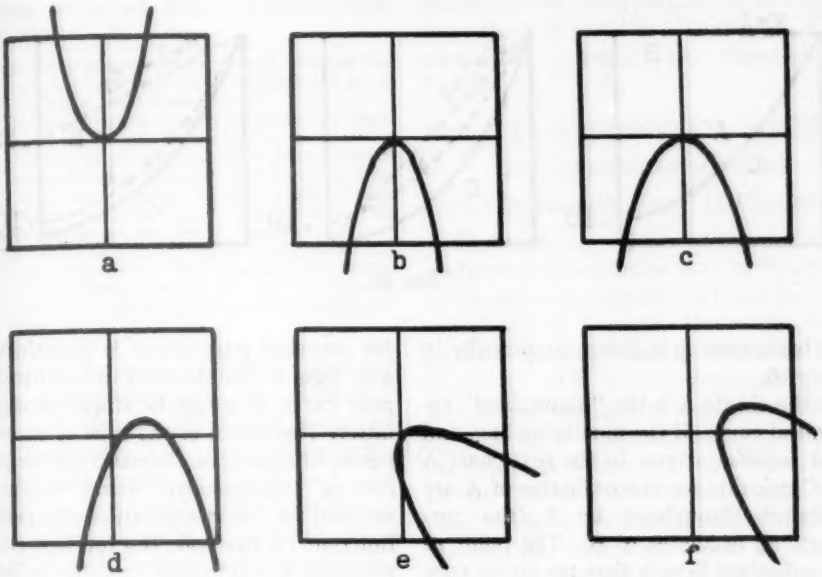


FIG. 15

(a) $x^2-y=0$
(b) $x^2+y=0$
(c) $.5x^2+y=0$
(d) $.5x^2-2.0x+y+1=0$
(e) $.25x^2+.25y^2+.50xy-.707x+.707y=0$
(f) $.25x^2+.25y^2+.50xy-2.207x-.793y+2.957=0$

factual though not always formally expressed. Even in mathematics multiplication by zero or unity is commonly not expressed. For example, the function $2x^4+0x^3+1x^2+3x^1+4x^0$ is written as $2x^4+x^3+3x+4$. The three 1's ($x^0=1$) and the zero are not explicitly stated. Any so-called "unmodified" curve is at least multiplied by unity. And in mathematics one is just another number.

Both this fact and modification by a function of x may be illustrated by the exponential curve. This curve is discussed in detail later and it is therefore sufficient to say here that in its "unmodified" form it does not pass through zero at the end of the useful life of the asset. This intractability has practically thrown accountants into a tizzy for it has made the curve unusable for them in cases where there is no terminal or scrap value. It is a belief among accountants that an exponential curve cannot be made to pass through the point (1, 0). The fact is, however, that it can very easily be made to pass through not only the point (1, 0) but any other selected terminal point (1, v).

In the case of the "unmodified" exponential curve the ordinates actually are multiplied by the ordinates of an auxiliary straight line $y=1$. When it is desired to pass the exponential curve through zero, the modifying auxiliary line is pivoted to pass through the point (1, 0) and the ordinates of the exponential curve are then multiplied by the corresponding ordinates of the sloping straight line. If the "unmodified" curve passed through the point (1, .10) and it were desired to modify it to pass through the point (1, .05) the auxiliary modifying line would be pivoted to pass through the point (1, .50), and so on.

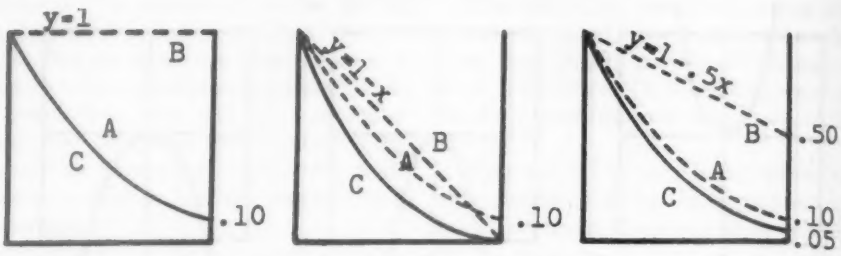


FIG. 16

This basic process is shown graphically in Figure 16.

In the charts A is the "unmodified" exponential curve, B the modifying line, and C the modified curve. In the first chart A and C coincide for the ordinates of A are multiplied throughout by 1 (the corresponding ordinates of B). The point to be emphasized here is that the curve may be modified at will to obtain an infinite number of variations. Modification of this type does not change the basic curve qualitatively, though it does (designedly) change some of its quantitative attributes.

It is obvious, then, that with a limitless variety of modifications at one's disposal almost any type of curve can be made to fit a given set of depreciation data. The selection of a curve, consequently, will not depend on mathematical definitions but upon practical considerations.

134—Polynomial Functions

But when a curve is desired for interpolation or other computational purposes, as is the case with depreciation problems, simplicity is at a heavy premium. And when a simply expressed and easily computed curve can be modified at will until for practical purposes it is indistinguishable from a complex and difficult-to-compute curve, it would be stupid to use the latter. The choice of the type of curve depends, of course, on the nature of the problem—a trigonometric curve might be selected for the interpolation of a periodic function, for example. But for depreciation purposes a polynomial function is by far the simplest. Milne's "Numerical Calculus" states: "Experience has shown that in general the polynomial interpolating function is the most useful, and for many reasons. Polynomials are simple in form, can be calculated by elementary operations, are free from singular points, are unrestricted as to range of values, may be differentiated or integrated without difficulty, and the coefficients to be determined enter linearly."

The equations utilizing polynomial functions, in the form suitable for depreciation problems (i.e., with the constant term unity) are shown below. The degree of the equation is determined by the highest exponent of x. The quadratic is the equation of a parabola and by extension higher degree functions are sometimes termed third, fourth, etc., degree parabolas. The follow-

Degree	$y=$	*Name*
0	1	Straight line parallel to x-axis
1	$1+ax$	Linear (straight line)
2	$1+ax+bx^2$	Quadratic
3	$1+ax+bx^2+cx^3$	Cubic
4	$1+ax+bx^2+cx^3+dx^4$	Quartic or biquadratic
5	$1+ax+bx^2+cx^3+dx^4+ex^5$	Quintic

ing may be stated with respect to these functions:

1. The first degree equation is that of a straight line and has long been used for computing linear ("straight line") depreciation.
2. The second degree or quadratic equation represents the simplest form of curve, the first step beyond the straight line, and is suitable for almost all depreciation problems likely to be encountered in practice. Within its limits it is an extremely flexible and versatile curve. Its properties are described in Part III.
3. The equations of higher degree (third, fourth, etc.) are rarely needed for depreciation purposes. They are also described in Part III, more to round out the subject than for any other purpose.

The plus signs shown in the equations are merely conventional as the coefficients (a, b, etc.,) may be either plus or minus. Thus if a were -2, the first degree equation becomes $y=1+(-2)x$ or $y=1-2x$. In fact, in any depreciation equation of this type there must be at least one minus sign. (The coefficient a is always negative.)

It may be said, then, that all linear depreciation may be computed by means of the first degree equation and practically all curvilinear depreciation by the second degree or quadratic equation given above. Before passing on to a presentation of quadratic functions it will be necessary first to take a look at the segmented schemes of accountants.

Now segmented schemes have no more *raison d'être* than have square wheels. Their origins are as inglorious as are those of a mule. If something must be written in the stud-book then truth compels the statement that they are by Ineptitude out of Ignorance. At least two segmented schemes foaled by these progenitors have been given names and a description of them might well be entitled: Two Little Misbegots and How They Grew. With characteristic ineptitude accountants have christened these the Declining Balance and the Sum-of-the-Years-Digits methods. These schemes have even achieved a dubious distinction by recognition in the Revenue Code of 1954. For the sake of simplicity these will hereinafter be referred to as the DB and the SD schemes. These segmented schemes are described in Part II

PART II—SEGMENTED SCHEMES

210—SEGMENTED METHODS

211—"Declining Balance" (DB) Method

The declining balance (DB) method of computing depreciation may be illustrated by an asset costing $30,000 and having a useful life of 5 years. Under the linear method the depreciation would be computed at 20% of the *original* cost or $6,000 per annum. As a constant rate is applied to a constant amount, the depreciation is constant from year to year. In the DB method a constant rate is applied to the *residual* (or depreciated) value and as this declines from year to year the amount of the annual depreciation also declines. For a given asset it follows that the depreciation computed by this scheme must be greater in the earlier years and less in the final years than is the case with linear depreciation. To bring this about a rate higher than the linear rate must be employed. As an example a rate of 40%, or double the linear rate, is used and the depreciation is computed thus:

Year	*Beginning Residual Value*	*Rate*	*Depreciation*
1	$30,000	.40	$12,000
2	18,000	.40	7,200
3	10,800	.40	4,320
4	6,480	.40	2,592
5	3,888	.40	1,555
6	2,333		

The residual value of $2,333 at the end of the fifth year is glibly assumed to represent the "scrap value" of the asset. This method, then, does not fully write off the cost of the asset over its life, and this arbitrary limitation is a very stupid one.

A simpler way of making the same computation is to obtain the residual values by multiplying by 1 minus the rate. The de-

preciation is then the difference between the successive residual values. In this case:

Year		*Ending Residual Value*	*Depreciation*
—		$30,000	
1	$30,000×.60	18,000	$12,000
2	18,000×.60	10,800	7,200
3	10,800×.60	6,480	4,320
4	6,480×.60	3,888	2,592
5	3,888×.60	2,333	1,555

A full exposition of the DB method is given in Exhibit A.

This method has long been known to accountants. It was probably initiated by some ignorant or inebriated bookkeeper who mistakenly applied the depreciation rate to the declining balance instead of to the original balance of the asset. Accountants saw that the values so obtained were non-linear and therefore came to appreciate the method, but they never learned how to handle it.

Now this is a very familiar type of function and if y represents the residual value expressed as a fraction of the whole value, m the number of years elapsed, and j the rate of depreciation, the equation is:

$$y=(1-j)^m.$$

Now $(1-j)$ is termed the base and as it is a constant it may be expressed by a single symbol k, thus:

$$y=k^m.$$

This is called an exponential function for the independent variable m is an exponent. If m may be any number the equation represents a continuous curve, but if m is restricted to integral values (1, 2, 3, etc.,) y will be represented by a series of disconnected points. When these points are joined by straight lines a segmented scheme is produced.

For all practical purposes y can be computed arithmetically only when m is an integer. Only laboriously and to a limited extent can y be computed for fractional values of m by the use of arithmetic. If a value were desired for y at the end of 3½ years, m would be 7/2. To compute this one would have to take the square root of the seventh power of the base. And at the end of eight years and one month m would be 97/12. To compute the value of y, one would have to extract the 12th root of the 97th power of the base, and life is much too short to attempt this arithmetically. Of course the computation could readily be made by means of a table of logarithms, but the average accountant would sooner put his hand in a barrel of rattlesnakes than in a book of logarithms. Consequently, for accounting purposes only integral values of m are recognized and intermediate values are obtained by linear interpolation. This, as stated above, produces a segmented scheme. Not only is this a very clumsy and a very stupid expedient but the exponential function upon which it is based is unsuited to depreciation purposes. It has been toyed with by accountants simply because it is almost the only curve they have known how to approximate by arithmetical means.

As indicated in the illustration above, y will never equal zero, and this has disturbed accountants no end for they were unable to use the curve in case where there is no terminal residual value (scrap value). More than that, they had no idea how to make the curve pass through a preselected scrap value. Consequently, practically the only curve that accountants have been able to produce was apparently so inflexible that it could not be used generally. The only solution seemed to be to go along with the curve and arbitrarily assume that the terminal residual value that it produces is a fair scrap value, but this assumption is so erroneous that it cannot be swallowed in the majority of cases. Some few village Hampdens among accountants, with dauntless breasts and a smattering of algebra, have this mathematical tyrant of their fields withstood,

but to little avail. By reducing the magnitude of the base (which means to increase the rate) the curve can be made to approach zero very closely at the end of the useful life of the asset—to an amount less than $1.00 if desired. But this produces a curve with an impossibly high initial slope; the mathematical solution then does not agree with the facts of depreciation.

The laugh in this comedy of ignorance is the fact that it is actually a childishly simple matter to modify an exponential curve so that it will pass through any preselected terminal value, including zero. One method of doing this has been outlined in sub-section 133 and other methods are available. But accountants have never been able to accomplish this and in their bafflement they have turned to the SD segmented scheme which does pass through the point (1, 0).

212—"Sum-of-the-Years-Digits" (SD) Method

The "sum-of-the-years-digits" method divides the life of the asset into a number of parts determined by adding the terms of the series $n+(n-1)+(n-2)+\cdots+3+2+1$ where n is the number of years in the life of the asset. This sum may be more simply obtained from the formula $s=.5n(n+1)$. The depreciation for the first year is n/s of the cost of the asset, for the second year $(n-1)/s$, and so on. In the illustrative case given here the asset has a life of 5 years and the "sum of the digits" is:

$$5+4+3+2+1=15$$

or

$$.5\times5\times6=15$$

The depreciation for the first year is 5/15 of the cost of the asset, for the second year 4/15, and so on.

In the case of the asset having a cost of $30,000, the depreciation and residual values will be as follows:

End of Year	*Depreciation*	*Residual Value*
—		$30,000
1	$10,000	20,000
2	8,000	12,000
3	6,000	6,000
4	4,000	2,000
5	2,000	none
Total	$30,000	

This method writes off the entire cost over the life of the asset.

A full exposition of the SD method is given in Exhibit B.

213—Comparison of Methods

The linear, DB, and SD methods are compared below:

End of Year	*Residual Values*			*Cumulative Depreciation*		
	Linear	*DB*	*SD*	*Linear*	*DB*	*SD*
—	$30,000	$30,000	$30,000			
1	24,000	18,000	20,000	$ 6,000	$12,000	$10,000
2	18,000	10,800	12,000	12,000	19,200	18,000
3	12,000	6,480	6,000	18,000	23,520	24,000
4	6,000	3,888	2,000	24,000	26,112	28,000
5	none	2,333	none	30,000	27,667	30,000

The depreciation for any year is the difference between the residual values at the beginning and end of the year. The cumulative depreciation is the difference between the initial value of the asset and the residual value at the end of any year.

In the above example the DB method reflects the greatest depreciation for the first two years but the SD method catches up with it by the end of the third year and

thereafter exceeds it. The two non-linear schemes produce the greatest acceleration of depreciation with assets of relatively short lives; the excess over the linear method is not so great with assets of comparatively long lives.

It should be emphatically stated that any assertion to the effect that non-linear depreciation "recovers the cost of the asset more quickly" is simply preposterous. Any given scheme either follows the physical facts and correctly reports depreciation or it does not follow the facts and misstates it. The idea that "cost is recovered" by recording the depreciation of physical assets, so widely expressed in accounting literature, revenue codes and their concomitant regulations, and in other pronouncements, is one of the most asinine concepts to be found in print. The cost of an asset is no more "recovered" by recording depreciation than cash is "recovered" by recording disbursements. Disbursements diminish the magnitude of the cash assets and depreciation diminishes the magnitude (recorded value) of the property assets. Each, then, represents a diminution of an asset value and is a fact independent of accounting. The accounting may conform or not conform to the facts but it cannot alter, modify, or alleviate them. The belief that departed values can be "recovered" by making ink marks on a piece of paper is a sort of clerical voodooism. There is no "recovery"—there is simply reporting and the reporting is good, bad, or indifferent *au fur et à mesure* that it conforms to fact. A manufacturer could dump his products in the ocean—thereby "recovering" nothing—yet his accounts, if correct, would reflect the depreciation of his equipment. The "recovery" concept is probably the most appalling imbecility accepted by a technical group since the medical profession abandoned the equally sciolistic practice of blood-letting a century or more ago.

220—THE REVENUE CODE OF 1954

221—Non-linear Methods of Code

The Revenue Code of 1954 extends the use of non-linear depreciation methods by liberalizing the "declining balance" (DB) method, by including the "sum-of-the-years-digits" (SD) method, and by permitting other methods subject to certain limitations. The non-linear methods of the Code may be outlined thus:

1. Specifically defined
   a. "Declining balance" method in which the rate may be *twice* the linear rate (instead of the previous 1.5 times).
   b. "Sum-of-the-years-digits" method.
2. Any other consistent method, subject to the following limitations:
   a. The rate for the first year must not be greater than twice the linear rate for the same life.
   b. The aggregate depreciation for the first two-thirds of the life of the asset must not exceed that of the "declining-balance" method for the same period.

These non-linear schemes may be applied only to *new* assets having a life of three years or more. New assets are those whose original use commences (a) with the taxpayer and (b) after December 31, 1953. The depreciation of assets acquired or constructed prior to that date is to be determined under methods previously in effect. No formal election to use the non-linear methods need be made by the taxpayer provided he initiates their use in the first taxable year ending after December 31, 1953. Thereafter permission to change to these methods must be obtained from the Commissioner. But the taxpayer may change at any time from the DB method to the linear method provided he has not entered into an agreement with the Commission prohibiting it.

The non-linear methods are intended to give relief to the taxpayer by allowing heavier deductions immediately after the original outlay for the purchase or construction of the asset. Suppose that an asset costing $30,000.00 has a useful life of five years. If the income tax rate for a

corporation were (say) 52%, the depreciation deductions over five years would result in tax reductions of $15,600.00. The net cost to the taxpayer therefore would be only $14,400.00. The net outlay on the linear and on the SD method, representing the original cost less the tax reductions attributable to depreciation deductions, would be as follows:

	Linear			*SD*		
End of Year	*Depreciation*	*Tax Reduction*	*Net Outlay*	*Depreciation*	*Tax Reduction*	*Net Outlay*
—			$30,000			$30,000
1	$6,000	$3,120	26,880	$10,000	$5,200	24,800
2	6,000	3,120	23,760	8,000	4,160	20,640
3	6,000	3,120	20,640	6,000	3,120	17,520
4	6,000	3,120	17,520	4,000	2,080	15,440
5	6,000	3,120	14,400	2,000	1,040	14,400

The "relief" is somewhat illusory. If conditions remain static there is no ultimate tax saving. If tax rates should decrease the taxpayer would gain; should they be increased in the future (by the reimposition of an excess profits tax, for example) the taxpayer would suffer by reason of the earlier "accelerated" depreciation. The taxpayer does, however, receive some advantage in the way of current financing in the early years following the acquisition of the asset, which would be helpful to a growing business, but this advantage must be paid for in the later years. The amount of relief over the linear or "straight-line" depreciation is hardly enough to make taxpayers break out into loud huzzahs. This is evident when the actual saving is computed.

The saving through the use of the SD method in the foregoing example can be computed by assuming that the taxpayer used the linear method and borrowed the difference between the net outlays on the two methods. The interest on the borrowings would be deductible for tax purposes. Assuming an interest rate of 5%, the saving would be as follows:

Year	*Borrowings*	*5% Interest*	*Tax Reduction (52%)*	*Net Interest Cost*
2	$2,080	$104.00	$54.08	$ 49.92
3	3,120	156.00	81.12	74.88
4	3,120	156.00	81.12	74.88
5	2,080	104.00	54.08	49.92
			Total	$249.60

The saving by the SD method can be formulated thus:

$$\text{saving} = \frac{I(1-T)T}{6}(n-1)$$

where n = number of years in life of asset, I = interest rate, and T = tax rate. When $I = .05$ and $T = .52$,

$$\text{saving} = .00208(n-1)$$

In the case of a 5 year life and a $30,000 cost

$$\begin{aligned}\text{saving} &= .00208 \times 4 \times \$30{,}000 \\ &= .00832 \times \$30{,}000 \\ &= \$249.60\end{aligned}$$

In these formulations compound interest has not been computed on the net interest cost and the fact that income taxes are payable in instalments after the end of the taxable year has been ignored.

The DB method cannot be compared with a linear scheme in which there is either no scrap value or a scrap value different from the terminal value of the DB scheme, for the aggregate depreciation amounts would not be the same. The two schemes can be compared only if it is as-

sumed that the linear scheme will have the same terminal value as the DB scheme, that is,

$$v=\left(\frac{n-g}{n}\right)^n,$$

or when $g=2$,

$$v=\left(\frac{n-2}{n}\right)^n.$$

(The annual DB rate is a multiple g/n of the linear rate $1/n$; the maximum value allowed by the Code for g is 2.) In the DB scheme illustrated above this terminal value is $2,333. If this assumption is made, the saving by the DB method can be formulated thus:

$$\text{saving}=I(1-T)T \cdot \left\{n-\left(\frac{n+1}{2}+\frac{n-g}{g}\right)\left[1-\left(\frac{n-g}{n}\right)^n\right]\right\}.$$

When $g=2$ (the maximum), $I=.05$, and $T=.52$,

$$\text{saving} = .01248\left\{n-\frac{2n-1}{2}\left[1-\left(\frac{n-2}{n}\right)^n\right]\right\}.$$

When $n=5$ and the cost of the asset is $30,000,

$$\text{saving}=.01248\times.84992\times\$30,000$$
$$=.0106070016\times\$30,000$$
$$=\$318.21$$

When the taxpayer sees the accelerated depreciation for the first year he thinks, "Oh boy, this for me!" without figuring out the net ultimate saving. Actually the saving is too small to bother with except for very large acquisitions.

The Code non-linear schemes, being based on the number of whole years—integers, in short—makes no provision for assets acquired during the year and placed in use for only a fraction of a year. Conceivably—though Code definitions would appear not to sanction it—the life of the asset might be expressed in half-years, quarter-years, or even months. This, however, would result in significant departures from depreciation based on the number of whole years. Nor do the Code schemes allow for an estimated life corresponding to (for example) a linear rate of 6%, for that would represent a life of 16-2/3 years. Proposed regulations amplifying and interpreting the Code provide for apportionment of the depreciation computed under the Code methods between two taxable years. Thus, if an asset were to be placed in use for the last four months of the taxable year, the depreciation for that year and subsequent years would be computed thus under the SD method (using the example of the $30,000 asset with a 5 year life given above):

Depreciation Year	*Depreciation*	*Taxable Year* 1	2	3	4	5	6
1	$10,000	$3,333	$6,667				
2	8,000		2,667	$5,333			
3	6,000			2,000	$4,000		
4	4,000				1,333	$2,667	
5	2,000					667	$1,333
Total		$3,333	$9,334	$7,333	$5,333	$3,334	$1,333

Thus a clumsy adjustment is superimposed on a clumsy scheme.

222—Limiting Curves of the DB and SD Methods

In order to generalize the DB and SD schemes of the Code and to permit limits

to be computed, the conventions shown graphically in Figure 14 and described in subsection 131 have been adopted. Both the whole value and the whole life of the asset are expressed by unity (1.0). The residual value and the elapsed time at any point are expressed respectively as fractions of the whole value and the whole life. This permits comparisons to be made between individual cases even though the dollar amounts and the number of years in the useful lives are not the same. In the following, the DB case considered is that in which the rate is the maximum of -2, or twice the linear rate of -1.

In Figure 21 the DB scheme having the maximum initial slope of -2 is shown for lives of 3, 4, 5, and 10 years and in Figure 22 the SD scheme is shown for lives of 3, 5, and 10 years. As the number of years in the life of the asset increases, it is evident that the segmented schemes approach limiting curves (represented by the broken lines). The DB segmented schemes approach their limiting curve from below and the SD segmented lines approach from above. The charts are too small in scale to show many examples of the segmented schemes but the fact that they do approach limiting curves is readily demonstrable mathematically. How much easier and how much more scientific it would be to employ the simpler of these limiting curves as the base for a depreciation scheme instead of the clumsy hodge-podge of segmented lines. The curve would be self-consistent for any length of life and the residual values for any fractional part of a year could be easily computed.

The limiting curves shown in Figures 21 and 22 are generalized representations of the crude and primitive DB and SD segmented schemes of non-linear depreciation. It will be well to review these generalized methods—not because they have any standing under the Code—but in order to show the possibilities of logical and self-consistent depreciation methods. The equations for the two limiting curves are:

$$\text{DB} \quad y=(.1353353)^x$$

$$\text{SD} \quad y=1-2x+x^2=(1-x)^2$$

The DB limiting curve is not represented by an algebraic function but by a transcendental one. It is an exponential function with an initial slope of -2 and is difficult to compute. In fact a table of logarithms is necessary for any aliquant or non-aliquot part of the life. Such a curve

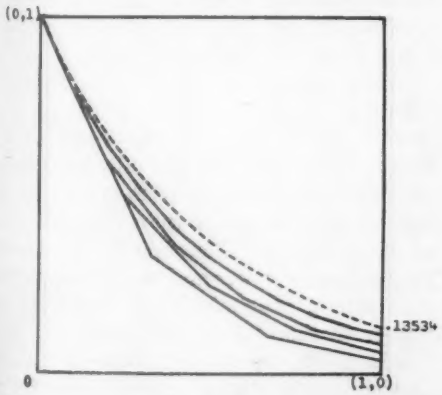


FIG. 21

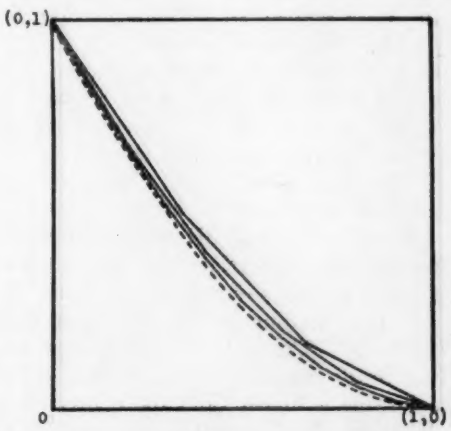


FIG. 22

is unnecessarily complex for a depreciation scheme and should be ruled out of consideration. Far more satisfactory schemes may be obtained by curves that are much simpler to compute than is a curve of the exponential type.

The SD limiting curve is a simple algebraic function (a quadratic) and is extremely easy to compute.

The properties of both these segmented schemes and their limiting curves are outlined in Exhibits A and B.

223—Limitation on "Other" Methods

The Revenue Code of 1954 specifically provides for the DB and SD *segmented* methods, that is, the computations are based on the *number of years* in the life of an asset. As a result, each of the two methods has a different depreciation scheme for each length of life. The Code also permits any other consistent method provided (a) that the initial slope is not greater than twice the linear slope and (b) that the residual value when two-thirds of the useful life of the asset has elapsed shall not be less than that under the DB method. In expressing this limitation the Code shifts from the number-of-years basis to the fraction-of-the-life basis used herein. In the segmented methods provided for by the Code both the whole life and the elapsed time are expressed as integers, and two-thirds of (for example) an 8-year or a 10-year life cannot be expressed by integers. In order to find the depreciation to, or the residual value at, the two-thirds point it is necessary to interpolate.

Now the DB and SD limiting curves—representing generalizations of the segmented methods—undoubtedly come under the heading of "other consistent methods." The DB curve satisfies the two-thirds point requirement for its residual value is higher (and the depreciation deductions less) at that point than is that of any of the segmented methods based on the number-of-years. That, however, is not the case with the SD limiting curve. The following is a comparison of the residual values at the two-thirds point for the two methods:

No. of Years	*Residual Values* DB	SD
Segmented schemes:		
3	.111	.167
4	.158	.156
5	.182	.148
6	.198	.143
7	.208	.139
8	.216	.136
9	.221	.133
10	.226	.131
15	.239	.125
20	.245	.122
50	.256	.115
Limiting curve	.264	.111

The computations for the segmented schemes were made from the equations:

$$\text{DB} \quad y=\left(\frac{n-2}{n}\right)^{2n/3}$$

$$\text{SD} \quad y=\frac{n+3}{9(n+1)}$$

Strictly speaking, these are correct only when the number of years (n) is a multiple of 3. The other values should be obtained by interpolation between the two integer values immediately above and below the two-thirds point. This, however, would be a laborious process and the results would not vary greatly from the formulated values given above.

When n is greater than 3, the residual values at the two-thirds point are less under the SD method than are those under the DB method. Yet the SD method is specifically provided for in the Code. Even though, as n increases, the residual values of the segmented SD scheme approach the limiting curve closer and closer, the curve itself would probably be excluded as an "other method" not satisfying the two-thirds point requirement. This is highly illogical as the limiting curve is merely a generalization of the segmented SD method.

Segmented Scheme of Code

Let n = the number of years in the life of the asset and m = the number of years elapsed, and y the residual value at any point of time.

The annual linear rate is then $1/n$. The annual DB rate is a multiple (g) of the linear rate, or g/n.

Then

$$y=\left(1-\frac{g}{n}\right)^m=\left(\frac{n-g}{n}\right)^m$$

If $g=2$, the maximum allowed by the Code,

$$y=\left(\frac{n-2}{n}\right)^m$$

Example: $n=10$, $m=7$

$$y=\left(\frac{10-2}{10}\right)^7=.8^7=.2097152$$

Figure 21 shows the Code schemes for 3, 4, 5, and 10 years with the DB rates equal to twice the corresponding linear rates. The limiting curve for these segmented schemes is shown by the broken line.

The following is a table of residual values (y) for various lives (n) when the DB rate is twice the corresponding linear rates:

	y, when $n=$							
m	3	4	5	6	7	8	9	10
1	.3333	.5000	.6000	.6667	.7143	.7500	.7778	.8000
2	.1111	.2500	.3600	.4444	.5102	.5625	.6049	.6400
3	.0370	.1250	.2160	.2963	.3644	.4219	.4705	.5120
4		.0625	.1296	.1975	.2603	.3164	.3660	.4096
5			.0778	.1317	.1859	.2373	.2846	.3277
6				.0878	.1328	.1780	.2214	.2621
7					.0949	.1335	.1722	.2097
8						.1001	.1339	.1678
9							.1042	.1342
10								.1074

When $m=0$, $y=1.0000$

Limiting Curve of Segmented Scheme

The limiting curve of the DB segmented scheme is an exponential curve of the form

$y=k^x$ (in depreciation equations $k<1$)

$z=(2.302585093 \log k)k^x$

$a=2.302585093 \log k$ (when $x=0$, $k^x=1$)

$\log k=.4342944819\ a$ (The "log" here means common logarithms to the base 10).

When $a=-2$ (twice the linear rate)

$\log k=-2\times.4342944819=-.8685889638$

$=9.1314110362-10$

and

$k=.1353353$

The equations for the limiting curve of DB segmented schemes having a rate equal to twice the linear rate and for its slope are:

$$y=(.1353353)^x$$

$$z=-2(.1353353)^x$$

The following are ordinates and abscissas of this curve:

x	y	x	y
0	1.00000	.6	.30119
.1	.81873	.7	.24660
.2	.67032	.8	.20190
.3	.54881	.9	.16530
.4	.44933	1.0	.13534
.5	.36788		

Modification of Limiting Curve

Methods of modifying limiting curves of the exponential type are set forth in detail in Part IV.

Segmented Scheme of Code

The equation for the residual values y under the SD segmented scheme when n = the number of years in the life of the asset and m = the number of years elapsed is

$$y=\frac{(n-m)(n-m+1)}{n(n+1)}$$

If r is taken to represent the number of *remaining* years in the life, the equation can be written

$$y=\frac{r(r+1)}{n(n+1)}$$

The sum of the series represented by the scheme is

$$s=\frac{n(n+1)}{2}=.5n(n+1)$$

Example:

$$n=10,\quad m=7$$

$$y=\frac{3\times4}{10\times11}=\frac{12}{110}=.10909$$

Figure 22 shows the Code schemes for 3, 5, and 10 years and the limiting curve (broken line).

The following is a table of residual values (y) for various lives (n):

	y, when $n=$							
m	3	4	5	6	7	8	9	10
1	.5000	.6000	.6667	.7143	.7500	.7778	.8000	.8182
2	.1667	.3000	.4000	.4762	.5357	.5833	.6222	.6545
3	.0000	.1000	.2000	.2857	.3571	.4167	.4667	.5091
4		.0000	.0667	.1429	.2143	.2778	.3333	.3818
5			.0000	.0476	.1071	.1667	.2222	.2727
6				.0000	.0357	.0833	.1333	.1818
7					.0000	.0278	.0667	.1091
8						.0000	.0222	.0545
9							.0000	.0182
10								.0000

When $m=0$, $y=1.0000$

Limiting Curve of Segmented Scheme

The limiting curve of the SD segmented scheme is a quadratic curve having an initial slope of -2 and a terminal slope of 0. It passes through the point (1, 0)

The equations for the curve and its slope are:

$$y=1-2x+x^2=(1-x)^2$$

$$z=-2+2x=-2(1-x)$$

The following are ordinates and abscissas of the curve:

x	y	x	y
0	1.00	.6	.16
.1	.81	.7	.09
.2	.64	.8	.04
.3	.49	.9	.01
.4	.36	1.0	.00
.5	.25		

Modification of Limiting Curve

All algebraic modifications of this quadratic curve result in internal modifications and are described in detail in Part III.

230—RÉSUMÉ

There are, then, only two basic types of depreciation schemes, the rectilinear and the curvilinear. The two segmented schemes used by accountants and embodied in the Revenue Act of 1954 are only clumsy and bungling approximations to curvilinear depreciation. They have nothing whatever to commend them except the fact that they require no knowledge of mathematics beyond eighth grade arithmetic. But accountants have never been able to control even these crude and primitive makeshifts.

Control simply means that the curve must satisfy the stated requirements of a given problem. Control is not complete unless the curve can be made to satisfy at least these three conditions:

I—It must pass through a preselected terminal point (the "scrap" value).
II—It must start with a preselected initial slope. (Or to state it more generally, it must have a preselected slope at a preselected point.)
III—It must have a negative slope throughout.

Other conditions might be added but the foregoing are the basic conditions for control of the curve. The satisfaction of Condition II might not be required in all cases but it must be possible if desired. An uncontrolled curve is a meaningless absurdity.

Accountants have never succeeded in concocting a depreciation scheme that would meet even Condition I. Until fairly recently the only non-linear scheme known to them was the DB method and they were utterly unable to control it. They did not know how to make it pass through zero or any other preselected terminal value. More recently the SD scheme has been used. This (by crackey!) *does* pass through the point (1, 0)—and that fact is the sole reason for its use—but it doesn't go anywhere else, nor have accountants been able to make it go elsewhere. Condition II can be met by the DB scheme but not by the SD scheme. Condition III need not be considered in connection with segmented schemes for by construction these have negative slopes and do not change to positive slopes; it must be watched, however, in connection with curvilinear schemes.

As shown herein, both the DB and SD segmented schemes have curves as limits. The former is an exponential curve and the latter a quadratic curve. These curves are generalized forms of the clumsy segmented schemes and if accountants knew how to control them they would be infinitely superior to the corresponding segmented schemes. Now it so happens that although these curves may be modified to fit almost any set of data, they are not both equally acceptable for depreciation purposes.

Any modification, to be practical, must be algebraic, that is, by the operations of addition, subtraction, multiplication, division, involution, and evolution. Now the quadratic is an algebraic curve and any algebraic modification merges with the "unmodified" curve and the result is another algebraic curve. In short, the modification is internal. The exponential curve, however, is represented by a non-algebraic or transcendental equation. When modified algebraically the two parts remain distinct even though the modified curve is expressed by a single equation. Consequently, control of the quadratic curve is easily effected by simple internal modification whereas the exponential curve must be controlled by elaborate external modification through the means of auxiliary curves. The quadratic, then, is easy to compute and easy to control and within its limits is almost ideal for accounting purposes. On the other hand, the exponential curve is relatively difficult to compute and its control involves complexities that render it almost useless for depreciation schemes. It should therefore

be disregarded by accountants.

Part III treats of polynomial functions, principally those of the second degree, the quadratic. By the methods outlined therein a simple curve that will fit almost any depreciation data closely may be obtained merely by substituting values in a formula. The quadratic (and higher degree polynomials) could supersede segmented schemes now in use to the great advantage of accountants.

Part IV treats of the exponential curve. This part has no real utility but is added as a sort of appendix because of the long and unsuccessful attempts of accountants to apply the exponential curve to depreciation problems. Accountants have never realized the disabilities of this type of curve because they have never faced and solved them. Part IV contains the first exposition in accounting of the methods necessary to control an exponential curve if it is to satisfy Conditions I, II, and III. Although the curve should be rejected for accounting purposes, it will not be so disqualified until its complexities are set forth for all to see, and to set these forth is the primary purpose of Part IV. A secondary purpose is to illustrate methods of modifying difficult and refractory curves.

It is true that the exponential curve is the classic "decay" curve. It is used in science to compute the loss of heat of a body, the rate at which a solid is dissolved in an acid, the change of air pressure with altitude, and so on. Its applications, however, are to precise and exactly measurable physical phenomena. There is only a feeble analogy between such phenomena and the decline in value of an asset, which can be measured only subjectively and not instrumentally. The exponential curve was not selected by accountants through any process of ratiocination but simply because they stumbled on it and there is no reason to continue its use when simpler curves are available. Many things in an adverse environment do decline in a manner roughly parallel to the exponential curve—deaths per 100,000 from pneumonia over the past century, the number of bison in North America, and so on. But the actual decline never follows a theoretical curve indefinitely in a limited environment or in one not governed by physical laws. Accordingly, no valid argument for the use of the exponential curve for depreciation purposes can be based on purely mathematical considerations. Any curve that follows experience fairly closely is acceptable and a simple curve is preferable to a complex one. The quadratic curve is simple, the exponential curve is relatively complex.

PART III—THE POLYNOMIAL CURVE

310—QUADRATIC FUNCTIONS

311—Description

The quadratic is a polynomial function of the second degree (see sub-section 134 and the following sub-section 321). The general equation of a second degree curve of this type in the form suitable for depreciation purposes (i.e., with the constant term unity) and the equation for the slope thereof are:

$$y = 1 + ax + bx^2$$

$$z = a + 2bx$$

The quadratic is easy to compute and to differentiate (in order to obtain the slope). It is a reasonably flexible curve and is suitable for almost any depreciation problem likely to be encountered in practice. Any set of circumstances beyond its limits can be handled by polynomials of higher than the second degree.

The quadratic is so adaptable that for all practical purposes it can be made to duplicate any complex curve. There is not the slightest reason, therefore, for employing any transcendental (non-alge-

braic) functions, such as the exponential curve, for depreciation computations. It is the easiest of all curves to compute or to fit to data.

As hereinbefore shown the limiting curve of the SD segmented scheme is the quadratic equation.

$$y = 1 - 2x + x^2 = (1 - x)^2$$

This curve is so easy to compute—in most instances the computations can be made mentally—and the SD scheme approaches it so rapidly and closely that it is asinine to think of using the segmented scheme further. To sum up, the quadratic is the generalized form of the SD segmented scheme and it can duplicate (for all practical purposes) the complex DB segmented scheme and its limiting exponential curve. The quadratic therefore can take the place of both the segmented schemes.

Again it should be emphasized that the quadratic by itself has no relation to depreciation. It is merely a very simple and flexible type of curve that can readily be made to approximate a set of factual data. The data give validity to the curve, not the other way around.

It is necessary to know the limits and internal mechanism of the quadratic curve before attempting to apply it.

312—Limits

The initial slope of the quadratic curve cannot exceed -2 when there is no scrap value, for the terminal slope is then zero. If the initial slope were greater, the curve would drop below its terminal value and then rise up to it. This is illustrated by the following curves having an initial slope of -3, one without a "scrap" value and one with a "scrap" value of .15. The equations for the two curves are

$$y = 1 - 3x + 2x^2$$

$$y = 1 - 3x + 2.15x^2$$

The charts of the two curves are shown in Figure 31. Such curves, of course, are meaningless for depreciation purposes as no asset declines to a negative value (or to a value less than the scrap value) and then rises to zero value (or the scrap value) at the end of its life. These curves satisfy Conditions I and II for control but not Condition III.

The limits of both the initial slope (a) and the terminal slope (t) are therefore:

	$v=0$	$v>0$
a	-2 to -1	$-2(1-v)$ to $-(1-v)$
t	0 to -1	0 to $-(1-v)$

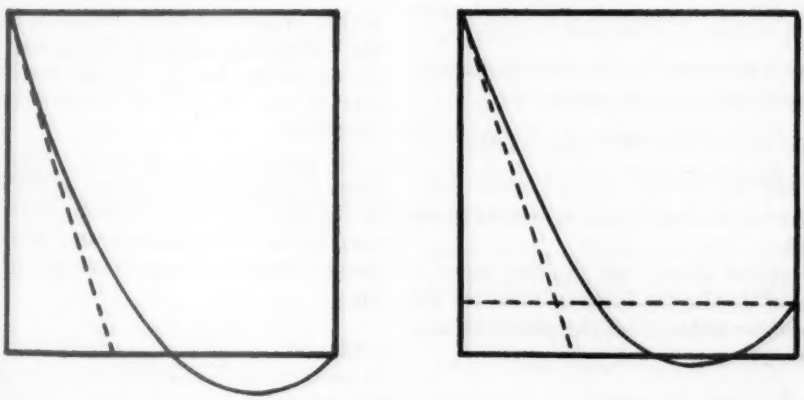


FIG. 31

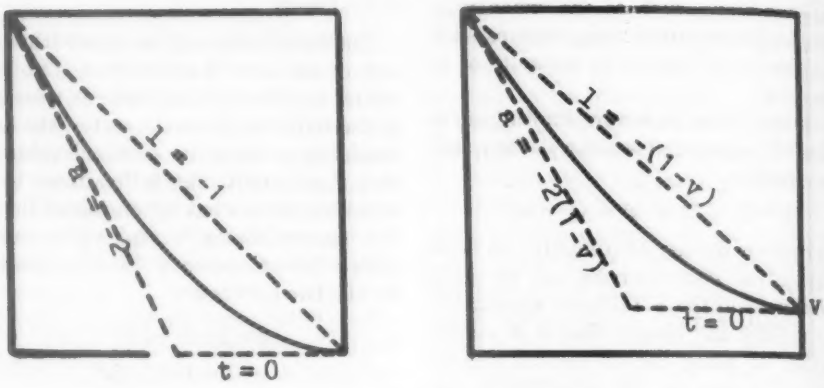


FIG. 32

These limits are shown graphically in Figure 32 (l = the linear slope). The curves shown in Figure 32 are limiting curves, for they have terminal slopes of 0 and therefore the greatest possible initial slopes. The slopes are those of the straight lines tangent to the curves at their initial and terminal points. An infinite number of curves passing through the points (0, 1) and (1, 0) or (1, v) may be constructed between these limiting curves and the straight line (see Figure 33). When a and t are -1 or $-(1-v)$, the curve coincides with the straight line. When a is between $-(1-v)$ and 0, or t is between $-(1-v)$ and $-2(1-v)$, a concave-downward curve results.

The equations for the limiting curves with and without scrap values are

$$y=1-2(1-v)x+(1-v)x^2=v+(1-v)(1-x)^2$$

$$y=1-2x+x^2=(1-x)^2$$

When $v=0$ the first equation reduces to the second.

As stated above, the limiting curve $y=(1-x)^2$ is also the limiting curve for the SD scheme of the Code, as shown in subsection 222.

313—Selection of Curves

Either the initial slope or the terminal slope may be selected between the limits given in sub-section 312 but not both. In a second degree equation the initial slope is a function of the terminal slope, and vice versa. The selection of one fixes the other, for they are related thus:

With scrap value $\quad a+t=-2(1-v)$

Without scrap value $\quad a+t=-2$

Both slopes, therefore, cannot be selected any more than one can demand that a rectangular rug with an area of 100 square feet be 12 feet long and 8 feet wide. If the rug is to have an area of exactly 100 square feet one or the other of these dimensions may be selected but not both. In higher degree functions of this type both the initial and terminal slopes may be selected (within limits) and this flexibility is one of the reasons for employing such functions.

In equations of this type the initial slope a is also the coefficient of the x-term of the equation. The symbol a therefore is used herein for both. As stated above, the general form of the quadratic and its slope are:

$$y=1+ax+bx^2$$

$$z=a+2bx$$

By selecting the coefficients a and b, any desired curve can be constructed between the limiting curve and the straight line

passing through the points (0, 1) and (1, 0) or (1, v). The coefficients a and b are related thus:

With scrap value $a+b=-(1-v)$.

Without scrap value $a+b=-1$.

If the initial slope a is selected, the following equations may be used for the curve and its slope:

(1) $$y=1+ax-[a+(1-v)]x^2$$
$$z=a-2[a+(1-v)]x$$

If $v=0$, these equations reduce to the following:

(2) $$y=1+ax-(a+1)x^2$$
$$z=a-2(a+1)x$$

While it is unlikely that the terminal slope t would be selected in preference to a, the corresponding equations are:

(1) $$y=1-[t+2(1-v)]x+[t+(1-v)]x^2$$
$$z=-[t+2(1-v)]+2[t+(1-v)]x$$

and (when $v=0$)

(2) $$y=1-(t+2)x+(t+1)x^2$$
$$z=-(t+2)+2(t+1)x$$

When $a=-2(1-v)$ or $t=0$ equations (1) reduce to the limiting curve with a scrap value:

$$y=1-2(1-v)x+(1-v)x^2$$
$$=v+(1-v)(1-x)^2$$
$$z=-2(1-v)(1-x)$$

And when $a=-2$ or $t=0$ equations (2) reduce to the limiting curve without a scrap value:

$$y=1-2x+x^2=(1-x)^2$$
$$z=-2+2x=-2(1-x)$$

In substituting values in the above equations careful regard must be given to plus and minus signs. In depreciation problems all slopes (other than 0) are negative. The equations are not as complex as they might seem to appear above. Once the scrap value v and the slope, either a or t, are selected, the coefficients become single numbers. This is shown in the following sub-section.

Sometimes it is convenient to consider the initial slope with respect to the *depreciable portion* of the asset instead of to the whole value; such a slope may be designated as a_1. Then, $a=a_1(1-v)$. Thus if a slope of -2 is applied to the depreciable portion of an asset having a scrap value of 12%, $a=-2(1-.12)=-1.76$. When $v=0$ of course $a=a_1$.

314—Applications

To illustrate the application of the equations in sub-section 313, let us obtain curves with and without scrap values (assume $v=.1$) that have the following values for the initial slope a:

$v=0$	$v=.1$
-1.8	$-1.8(1-v)=-1.62$
-1.6	$-1.6(1-v)=-1.44$
-1.4	$-1.4(1-v)=-1.26$
-1.2	$-1.2(1-v)=-1.08$

The equations for the curves without scrap values are then:

$$y=1-1.8x+.8x^2=(1-x)(1-.8x)$$
$$y=1-1.6x+.6x^2=(1-x)(1-.6x)$$
$$y=1-1.4x+.4x^2=(1-x)(1-.4x)$$
$$y=1-1.2x+.2x^2=(1-x)(1-.2x)$$

and those for the curves having scrap values are:

$$y=1-1.62x+.72x^2=.1+.9(1-x)(1-.8x)$$
$$y=1-1.44x+.54x^2=.1+.9(1-x)(1-.6x)$$
$$y=1-1.26x+.36x^2=.1+.9(1-x)(1-.4x)$$
$$y=1-1.08x+.18x^2=.1+.9(1-x)(1-.2x)$$

The equations are given in their factored form as they are often more easily computed in that form.

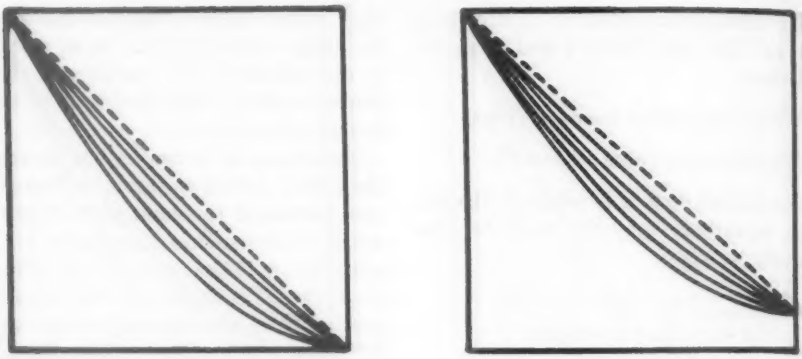


FIG. 33

The curves represented by the foregoing equations and the respective limiting curves are shown in Figure 33. Thus it is evident that whole "families" of curves lying between the limiting curve and the straight line can be constructed for any selected scrap value. This gives an infinite selection of depreciation schemes for any given set of conditions. The quadratic function therefore is able to handle almost any problem likely to arise in practice.

It might be thought that since the initial slope of a curve having a scrap value is less than the maximum of -2 permitted by the Code, or that of the limiting curve without scrap value, the use of the quadratic function would be disadvantageous to the taxpayer. This, however, is a matter of appearance or rather a matter of the base of reference. This limitation exists, it is true, with respect to the *whole value* of the asset but not with respect to the depreciable portion thereof. The maximum initial slope with respect to the depreciable part of the asset can still be the full -2. As a matter of fact, the Code does not allow a -2 slope where there is a scrap value. It allows an initial rate of twice the linear rate. Where there is a scrap value the linear rate is $-(1-v)$ and twice this is $-2(1-v)$, or exactly the initial slope of the limiting curve where there is a scrap value.

To illustrate, the equation for the limiting curve of an asset having a scrap value of .15 is $y=1-1.70x+.85x^2$. Here the initial slope with reference to the *whole value* is only -1.70. However, the limiting curve $y=1-2x+x^2$ with an initial slope of -2 could be applied to the .85 depreciable portion of the whole value and the .15 scrap value added to the product to obtain the residual value of the asset, as shown below:

	Direct	*Indirect*		
x	$y=1-1.70x+.85x^2$	$y=1-2x+x^2$	$.85y$	$.85y+.15$
0	1.0000	1.00	.8500	1.0000
.1	.8385	.81	.6885	.8385
.2	.6940	.64	.5440	.6940
.3	.5665	.49	.4165	.5665
.4	.4560	.36	.3060	.4560
.5	.3625	.25	.2125	.3625
.6	.2860	.16	.1360	.2860
.7	.2265	.09	.0765	.2265
.8	.1840	.04	.0340	.1840
.9	.1585	.01	.0085	.1585
1.0	.1500	.00	0000	.1500

Thus the two methods are the same and the maximum initial slope of -2 does apply to the .85 *depreciable* portion of the asset. In fact the equation may be written to show this identity, thus:

$$y=1-1.70x+.85x^2$$
$$=.15+.85(1-2x+x^2)$$

315—Comparison with Exponential Curve

The difference between an exponential curve and a quadratic curve having the same scrap value is negligible for depreciation purposes. This is evident when the limiting exponential curve for the DB method is compared with a quadratic curve having the same scrap value of .135. Now, a second degree parabola (quadratic), like a circle, can be passed through any three points in a plane (not in a straight line) and to make the fit close the quadratic curve will be passed through the initial point (0, 1), and the mid-point (.5, .368), and the terminal point (1, .135) of the DB limiting curve. The equation for this quadratic curve is $y=1-1.663x+.798x^2$ and the ordinates of the two curves are compared below:

x	*Exponential Curve*	*Quadratic Curve*	x	*Exponential Curve*	*Quadratic Curve*
0	1.000	1.000	.6	.301	.289
.1	.819	.842	.7	.247	.227
.2	.670	.699	.8	.202	.180
.3	.549	.573	.9	.165	.150
.4	.449	.462	1.0	.135	.135
.5	.368	.368			

The two curves are shown in Figure 34.

From a depreciation standpoint there is no choice between the two curves. And if there is no choice there is no reason for employing the complex exponential curve where the simpler and more flexible quadratic curve may be used. In fact, it may be said that for all practical purposes any exponential curve can be duplicated by a quadratic curve.

The equation for a quadratic curve that will pass through the initial (0, 1), mid (.5, p), and terminal (1, v) points of an exponential curve is

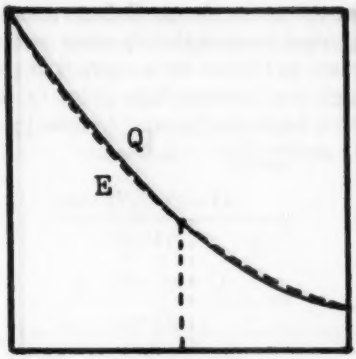


FIG. 34

$$y=1-[4(1-p)-(1-v)]x$$
$$+[4(1-p)-2(1-v)]x^2$$

This equation is not directly related to exponential curves in general but merely uses the midpoint and terminal ordinates of some particular exponential curve that has already been computed. The value of p must lie between the ordinates of the straight line and the limiting curve (see Figure 36). When $x=.5$ these values are:

Straight line $.5(1+v)$

Limiting curve $.25(1+3v)$

When $v=0$, p must lie between .25 and .50. When $v=.135$ as in the example given above, p must lie between .35125 and .56750. The value for p of .368 satisfies this requirement. Without exploring the matter mathematically, it appears likely that the midpoint of any exponential curve whose initial slope is not greater than -2 will fall within the limits as defined above.

The equation given above can also be used when it is desired to select a midpoint for the curve in addition to selecting the terminal or scrap value. The value selected for the midpoint must, of course, fall between the limiting values given above.

The values for the coefficients a and b of the general form of the equation $y=1+ax+bx^2$ are as follows for a curve that passes through any intermediate point (q, p) in addition to the initial and terminal points (0, 1) and (1, v):

$$a=-\frac{(1-p)-q^2(1-v)}{q(1-q)}$$

$$b=+\frac{(1-p)-q(1-v)}{q(1-q)}$$

The equation $y=1-1.663x+.798x^2$ could have been derived from these formulas by using the values $q=.5$, $p=.368$, and $v=.135$.

The Code sets an artificial limitation on "other consistent methods" by requiring that (in effect) the residual value when two-thirds of the life has elapsed must not be less than that of the DB scheme at the same point. If the DB limiting curve $y=(.1353353)^x$ were used as the criterion, the residual value at the two-thirds point would be .264. Let us pass a quadratic curve through the initial point (0, 1), the two-thirds point (2/3, .264), and the terminal point (1, .135). Here $q=2/3$, $p=.264$, and $v=.135$. Substituting in the formulas for a and b given above, the equation is found to be:

$$y=1-1.582x+.717x^2$$

This quadratic curve is compared with the exponential curve in the following summary and in Figure 35:

x	*Exponential*	*Quadratic*
0	1.000	1.000
.1	.819	.849
.2	.670	.712
.3	.549	.590
.4	.449	.482
.5	.368	.388
.6	.301	.309
.667	.264	.264
.7	.247	.244
.8	.202	.193
.9	.165	.157
1.0	.135	.135

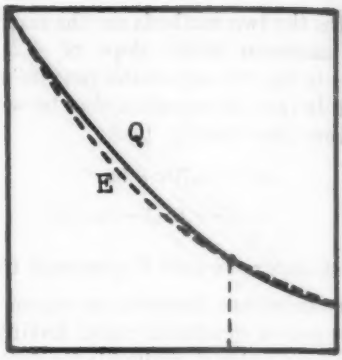


FIG. 35

This would satisfy the conditions of the Code, though the quadratic curve passing through the midpoint is a better all around approximation to the DB limiting curve.

In using the formulas for a and b, p must fall between the following upper and lower limits:

Upper $p_1=1-(1-v)q$

Lower $p_2=1-2(1-v)q+(1-v)q^2$

For $q=2/3$ and $v=.135$, these limits are $p_1=.4233$ and $p_2=.2311$. The value of .264 for p in the above example falls between these limits and is acceptable.

The relation of these limits to p and q is shown graphically in Figure 36.

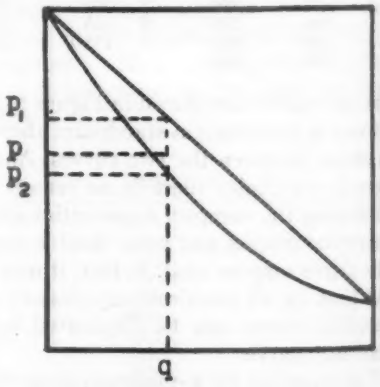


FIG. 36

The limits merely mean that to have a curve useful for depreciation purposes, the value of p for any given value of q must lie between the straight line and the limiting curve for the scrap value selected. Or, to put it another way, the point through which the curve is to be passed must lie in the "possible" area bounded by the straight line and the limiting curve. Mathematically there is no limitation on the location of the point (q, p) but unless it is located as stated the resultant curve is useless for a depreciation scheme.

Degree	*Equation* $y=$
0	1
1	$1+ax$
2	$1+ax+bx^2$
3	$1+ax+bx^2+cx^3$
4	$1+ax+bx^2+cx^3+dx^4$
5	$1+ax+bx^2+cx^3+dx^4+ex^5$

316—Summary

As shown in the foregoing, the quadratic curve can be made to do three things, namely:

A. Pass through the initial point (0, 1).
B. Pass through any preselected terminal point (1, v).
C. Either (but not both):
   1. Pass through any intermediate point lying in the area between the limiting curve and the straight line connecting the initial and terminal points, or
   2. Have within certain stated limits either (but not both):
      a. A preselected initial slope, or
      b. A preselected terminal slope.

The last alternative (C2) could be broadened to read "Have a preselected slope at a preselected point," for the initial and terminal slopes are only special cases under the general statement.

320—POLYNOMIAL FUNCTIONS OF HIGHER DEGREE

321—Characteristics

Polynomial functions of higher than the second degree may be formed simply by adding terms of higher degree. The characteristics of such curves are set forth below (O=none, C=constant, and A=accelerating):

Change of Slope	*Rate of Acceleration*	*Rate of Acceleration Change*
O		
O		
C	O	
A	C	O
A	A	C
A	A	A

In the above, A stands also for negative acceleration or deceleration.

The higher the degree of the function the more flexible it is and the more it can be made to do. These equations cannot be treated at length here but their capabilities may be likened to the control of an automobile under the following conditions

First degree

The driver holds the steering wheel at the zero point. The car then proceeds in a straight line.

Second degree

The driver turns the steering wheel to a selected point and holds it there. The car then travels in a circular path (a circle is represented by a second degree equation).

Third degree

The driver turns the steering wheel at a constant rate. The car travels in a more complex path.

Fourth degree

The driver turns the steering wheel at a constantly accelerating rate. The path of the car becomes still more complex.

Fifth degree

The driver turns the steering wheel at an increasingly accelerating rate. He now has practically unrestricted control of the steering wheel and the path of the car is almost anything he cares to make it.

It would be rather silly to use the higher degree equations widely for depreciation computations, for at best depreciation is only a rough estimate. A quadratic or second degree function will handle the vast majority of depreciation problems encountered in practice. However, it *is* limited by the fact that the maximum initial slope (or beginning depreciation rate) is -2.

322—Limiting Curves

Should initial slopes greater than -2 be required, equations of higher degree must be employed. For cases in which $v=0$, the limiting curves are powers of the straight line $y=1-x$. Thus:

Degree	*Limiting Curve and Slope*
2	$y=(1-x)^2$ $z=-2(1-x)$
3	$y=(1-x)^3$ $z=-3(1-x)^2$
4	$y=(1-x)^4$ $z=-4(1-x)^3$

The initial slope of the limiting curve is the maximum initial slope for a depreciation curve, as the terminal slope of the curve is then zero. From the equations for the slopes (z) given above it is seen that the initial slopes (occurring when $x=0$) are -2, -3, and -4. The terminal slope of each curve (occurring when $x=1$) is zero. Thus it is evident that a third degree equation will allow a maximum initial slope of -3, a fourth degree equation a maximum initial slope of -4, and so on.

The analogous equations where there are scrap values (v) are as follows:

Degree	*Limiting Curve and Slope*
2	$y=v+(1-v)(1-x)^2$ $z=-2(1-v)(1-x)$
3	$y=v+(1-v)(1-x)^3$ $z=-3(1-v)(1-x)^2$
4	$y=v+(1-v)(1-x)^4$ $z=-4(1-v)(1-x)^3$

These equations of the third and fourth degree are at once much more complex and much more flexible than the quadratic (second degree) equation. Both the initial and the terminal slope may be selected (within limits) which is not the case with the quadratic (see sub-section 312). And a greater variety of graduation is possible between the points (0, 1) and (1, v). Space, however, does not permit a detailed description of the properties of these higher degree curves.

The limiting curves and their initial slopes for equations of the second, third, fourth, and tenth degree are shown in Figure 37.

FIG. 37

The reason steeper initial slopes may be used with equations of higher degree is that the acceleration in the change of the slope permits the curve to turn more sharply. The initial direction of the curve therefore can vary more widely from the direction of the terminal point than is the case with curves of lesser degree.

323—Curve Fitting

Polynomial functions are very easy to fit to data by means of the method of least squares (see any book on elementary statistics). As an example, the data relative to the resale value of a certain automobile charted in Figure 11, sub-section 122, may be fitted with a curve. The resale values expressed as fractions of the

original cost are:

End of Year	*Resale Value*	*End of Year*	*Resale Value*
1	.750	5	.265
2	.575	6	.185
3	.455	7	.125
4	.365	8	.093

If the life of the automobile is eight years and the terminal value is .093, the linear slope would be $-.907$. The limiting quadratic curve would then be: $y=1-1.814x+.907x^2$. It will be noted that the value of the automobile declines 25% in the first year and this is steeper than is allowed by the maximum slope -1.814 of the quadratic limiting curve. This, therefore, is a case in which an equation of the third degree will give a better fit, and by the method of least squares the following equation is obtained:

$$y=1-2.062x+1.822x^2-.667x^3.$$

The ordinates of this curve are given below:

End of Year	*Resale Value*	*End of Year*	*Resale Value*
1	.769	5	.260
2	.588	6	.197
3	.448	7	.144
4	.341	8	.093

These agree quite closely with the original data, as is evident from Figure 38. It must be remembered that the data themselves do not lie on a curve and consequently there will always be small differences between the data and any curve fitted to them. The method of least squares reduces these differences to a minimum.

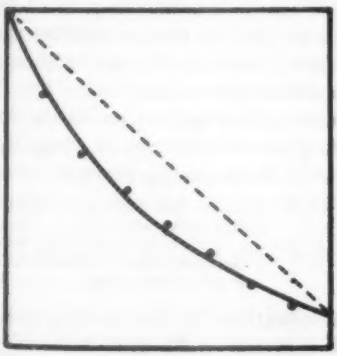


FIG. 38

330—INVERSE POLYNOMIALS

The quadratic and higher degree polynomial curves considered herein all have had vertical axes. It is, of course, perfectly possible to have analogous inverse curves with horizontal axes (or for that matter with inclined axes). But such curves lack the principal advantage of the vertical axis curves—ease of computation. The only reason for using them at all would be the fact that they might conceivably fit the data of a particular case better than would vertical axis curves. But the advantage would have to be very pronounced to justify the use of this sort of curve.

To illustrate by a quadratic, the general form of the horizontal axis curve would be

$$A+By+Cy^2=x.$$

When x (elapsed time) is the independent variable it is necessary to solve a quadratic equation to obtain the values of y, thus

$$y=\frac{-B\pm\sqrt{B^2-4C(A-x)}}{2C}.$$

(The coefficients A, B, and C here do *not* correspond to a, b, and c hereinbefore employed. For example, A is not the initial slope of this curve.) Not only is the computation of the ordinates of this type of curve difficult, but the formulation of a curve to meet prescribed conditions is much more complex. For example, if S designates the initial slope of the curve, then

$$A=-\frac{(1-v)^2-(1-v)-S}{S(1-v)^2}$$

$$B=+\frac{(1-v)^2-2(1-v)-2S}{S(1-v)^2}$$

$$C=+\frac{(1-v)+S}{S(1-v)^2}.$$

Thus, if $v=.1$ and $S=-1.8$, the resulting equation will be

$$\frac{1.9}{1.62}-\frac{2.9}{1.62}y+\frac{1.0}{1.62}y^2=x \text{ or}$$

$$1.9-2.9y+y^2=1.62x.$$

And the values of y are

$$y=1.45\pm.45\sqrt{1+8x}.$$

The horizontal line $y=1.45$ is the axis of this curve. Only the lower branch of the curve (a parabola) is serviceable for the problem, so the equation may be written:

$$y=1.45-.45\sqrt{1+8x}.$$

The equation for the slope of this curve is

$$s=-\frac{1.8}{\sqrt{1+8x}}$$

and the initial slope (when $x=0$) computed from this equation is found to be -1.8.

It is not too difficult to compute the ordinates of the curve with the aid of a slide rule; they are:

x	y	x	y
0	1.00	.6	.37
.1	.85	.7	.29
.2	.72	.8	.22
.3	.62	.9	.16
.4	.53	1.0	.10
.5	.44		

The chart of the curve is shown in Figure 39.

The dotted line in Figure 39 represents the vertical axis curve $y=1-1.8x+.9x^2$ which has the same initial slope (-1.8) and the same terminal value (.1) as the horizontal axis curve. Despite these agreements the segments of the two curves are quite different in shape. This is because a parabola is most curved near its vertex and flattens as the distance therefrom increases. The vertex of the horizontal axis curve is near the initial point (0, 1) whereas the vertex of the vertical axis curve is at the terminal point (1, .1). One curve might fit one set of depreciation data very well and the other another set.

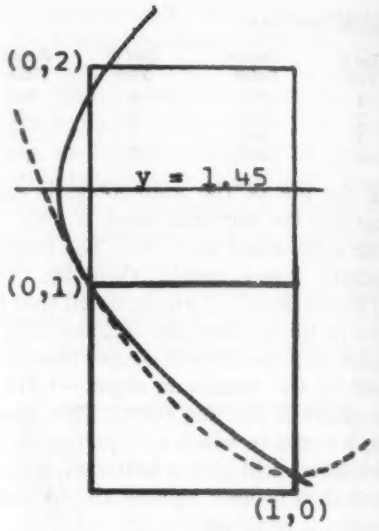


FIG. 39

340—NOTATION

Throughout the foregoing the terms $(1-x)$ and $(1-v)$ have been used, as the variables of the problems are the elapsed time (x) and the terminal or scrap value (v). Ordinarily it is best to present formulations so that the basic variables may be substituted directly therein without any intermediate operations.

However, the *appearance* of the formulations given herein may be simplified by the use of the following terms:

$u=(1-x)=$ the *unelapsed* time expressed as a fraction of the whole life.

$w=(1-v)=$ the *wasting*, or depreciable, portion of the asset value expressed as a fraction of the whole value.

The equations for the limiting curves of the quadratic, with and without scrap values, and the corresponding slopes, may

be written thus:

	$v=0$	$v>0$
General form	$y=1+ax+bx^2$ $z=a+2bx$	$y=v+w(1+ax+bx^2)$ $z=w(a+2bx)$
Limiting curves	$y=u^2$ $z=-2u$	$y=v+wu^2$ $z=-2wu$

The equations of the limiting curves are extremely simple in form. In the case where there is no scrap value, one need only square the unelapsed fraction of the life to obtain the depreciated value of the asset. For example, if .4 of the life remains, the depreciated value is .16 of the whole value of the asset. This is infinitely easier than the clumsy SD segmented method which has this quadratic curve for its limit.

PART IV—THE EXPONENTIAL CURVE

410—INTRODUCTION

The exponential function has long been used by accountants as the basis for non-linear depreciation schemes. But accountants lacked the mathematical knowledge necessary to control a curve and instead of one they came up with a clumsy segmented scheme ineptly termed the "declining balance" (DB) method.

Now almost any curve may be modified to fit a given set of depreciation data and the exponential curve $y=k^x$ is no exception. But it is a transcendental or non-algebraic curve and cannot be modified internally for depreciation purposes by algebraic operations. It must therefore be modified by means of an auxiliary curve. This auxiliary curve may be either rectilinear (straight line) or curvilinear, and the method of modification may be either additive or multiplicative.

The general equations for the linearly modified curves and their slopes are given as follows:

Additive Modification

$$y=k^x-(k-v)x$$

$$z=(2.302585093 \log k)k^x-(k-v)$$

Multiplicative Modification

$$y=\left[1-\left(1-\frac{v}{k}\right)x\right]k^x$$

$$z=k^x\left\{\left[1-\left(1-\frac{v}{k}\right)x\right](2.302585093 \log k)-\left(1-\frac{v}{k}\right)\right\}.$$

These equations are not quite as formidable as they appear, for they simplify themselves when numerical values are substituted for k and v.

The mathematics involved in such modifications is not particularly difficult—it is covered in the first semester of the first year of most college courses—but it is complex out of all proportion to the results obtained. Equally usable results can be obtained with far simpler functions, the quadratic for a striking example. And when an equation has been obtained that does satisfy the conditions of a particular problem there is still the task of computing the ordinates of the curve. This requires a table of logarithms and a considerable amount of arithmetical computation. The result simply isn't worth the effort expended to obtain it.

Consequently a full exposition of the modification of exponential curves would be waste of good paper. But because of the fascination of this curve for accountants—who never have been able to control it in the slightest degree—a brief outline is submitted here.

420—LINEAR MODIFICATION—PARTIAL

The first condition for control of a curve is that it be made to pass through a preselected terminal or scrap value. The

unmodified exponential curve does not pass through the point (1, 0) and this has bothered accountants considerably. Before presenting the methods necessary for full control of the exponential curve, simple means of passing the curve through any preselected terminal point (1, v) will be shown, including of course the point (1, 0).

421—Additive Modification

Additive modification of the exponential curve by means of a straight line is accomplished by adding to (or subtracting from) the ordinates of the curve the corresponding ordinates of a straight line passing through the point (0, 0). In the accompanying charts the "unmodified" or base exponential curve is indicated by A, the modifying line by B, and the modified resultant curve by C.

The method may be illustrated by modifying the limiting curve of the DB scheme, $y=(.1353353)^x$. The terminal or scrap value of this exponential curve is, of course, .1353353, which is both k and v. If it were desired to modify the curve so that it would pass through the terminal values 0, .10, and .20, the following equations may be obtained by substituting these values for v and .1353353 for k in the general equation given above:

(1) $y=(.1353343)^x-(.1353353-0)x$
$=(.1353353)^x-.1353353x$

(2) $y=(.1353353)^x-(.1353353-.10)x$
$=(.1353353)^x-.0353353x$

(3) $y=(.1353353)^x-(.1353353-.20)x$
$=(.1353353)^x+.0646647x$

These curves are shown in Figure 41.

422—Multiplicative Modification

Multiplicative modification of the exponential curve by means of a straight line is accomplished by multiplying the ordinates of the curve by the corresponding ordinates of a straight line passing through the point (0, 1).

If it were desired to modify the curve $y=(.1353353)^x$ to pass through the terminal values, 0, .10, and .20 the following equations result when these values are substituted for v and .1353353 is substituted for k in the general equation given above:

(1) $y=\left[1-\left(1-\frac{0}{.1353353}\right)x\right](.1353353)^x$
$=(1-x)(.1353353)^x$

(2) $y=\left[1-\left(1-\frac{.10}{.1353353}\right)x\right](.1353353)^x$
$=(1-.26109x)(.1353353)^x$

(3) $y=\left[1-\left(1-\frac{.20}{.1353353}\right)x\right](.1353353)^x$
$=(1+.47781x)(.1353353)^x$

The curves are shown in Figure 42.

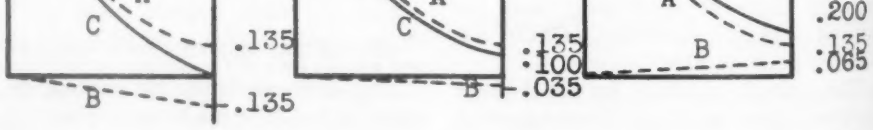


FIG. 41

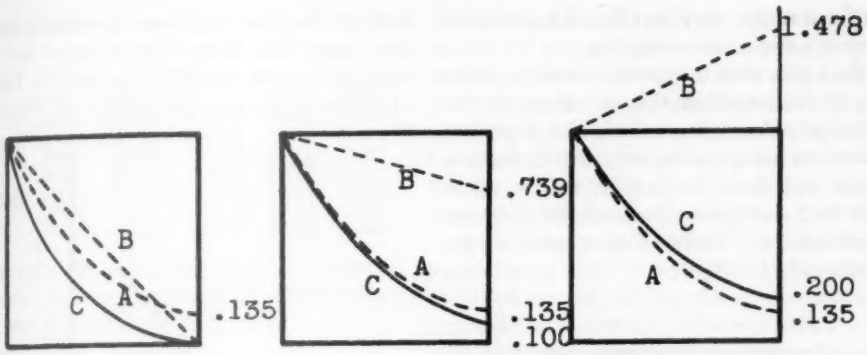


FIG. 42

423—Computation

The computation of the modified curves (C) from these equations is very simple. The additive and multiplicative modifications passing through the point (1, 0) are given below as examples:

		Additive		*Multiplicative*	
x	*A*	*B*	*C*	*B*	*C*
.0	1.000	−.000	1.000	1.0	1.000
.1	.819	−.014	.805	.9	.737
.2	.670	−.027	.643	.8	.536
.3	.549	−.041	.508	.7	.384
.4	.449	−.054	.395	.6	.270
.5	.368	−.068	.300	.5	.184
.6	.301	−.081	.220	.4	.120
.7	.247	−.095	.152	.3	.074
.8	.202	−.108	.094	.2	.040
.9	.165	−.122	.043	.1	.017
1.0	.135	−.135	.000	.0	.000

The above three place figures have been condensed from computations carried out to many more decimal places and any apparent discrepancies in the last decimal place above are attributable to this fact.

In these illustrative examples no attempt was made to select an initial slope for the modified curve. The base curve (A) has an initial slope of −2 whereas the modified curves (C) have the following initial slopes:

	Additive	*Multiplicative*
.0	−2.135	−3.000
.10	−2.035	−2.261
.20	−1.935	−1.522

These simple modifications do what accountants have never been able to do—pass an exponential curve through a preselected terminal point including the point (1, 0). But they merely skirt the problem of full control of the exponential curve.

430—LINEAR MODIFICATION—COMPLETE

431—Limits

As previously stated, no curve has any general utility for depreciation purposes unless it can be controlled in at least the following respects:

I—It must pass through a preselected terminal value ("scrap" value).
II—It must, if desired, have a preselected initial slope.
III—Its slope must be negative throughout.

The examples of partial control given above in Section 420 were made to satisfy only Condition I. They happen also to satisfy Condition III, though if other values had been chosen they might not have done so. They do not, however, satisfy Condition II as no attempt was made to select an initial slope. To do so requires a great deal more figuring and involves a number of mathematical complexities.

It would be of no general interest to present detailed examples of modifying an exponential curve to satisfy Conditions I, II, and III. The situation, therefore, will be

outlined only very briefly. The curious may try their own examples.

To begin with it is not possible to select any desired combination of values for the terminal value (v) and the initial slope (a). Solutions are possible only within certain limits and these limits differ for the additive and multiplicative methods of linear modification. These limits are shown graphically in Figure 43.

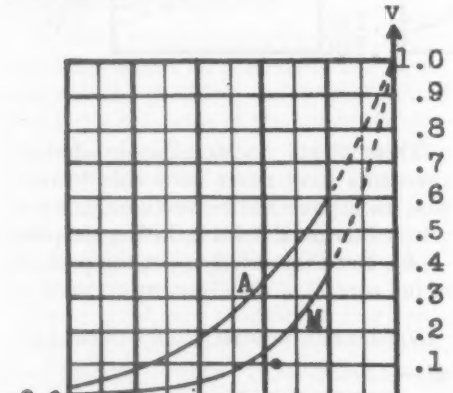


FIG. 43

In the figure the limit for additive modification is the curved line marked A and that for multiplicative modification by the curve marked M. There are no solutions for combinations of a and v lying above the limiting lines. If the horizontal and vertical lines from selected values of a and v meet on the limiting line there is a single solution. If the intersection of the two lines lies below the limiting line there are two mathematical solutions. When solutions are possible the values of a and v are said to be compatible.

In the case of additive modification one of the two solutions involves a value for k greater than unity. Though mathematically feasible, this second solution may be disregarded as by definition k is less than unity. In the case of multiplicative modification the two solutions involve a low base curve that is modified upward and a high base curve modified downward. This situation is shown graphically in Figure 44.

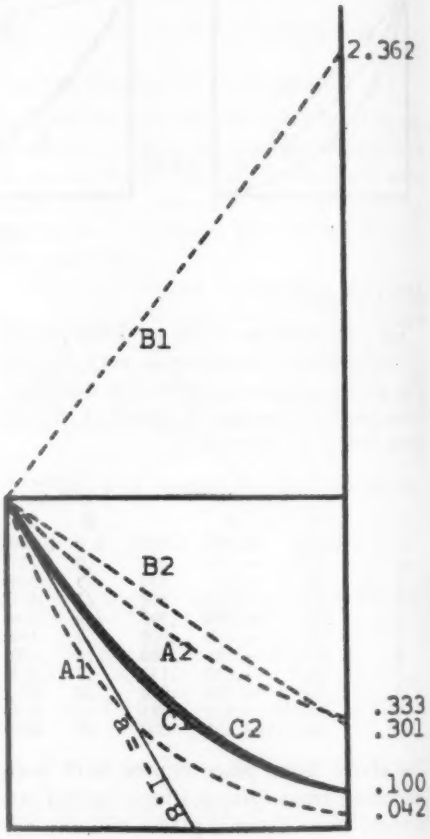


FIG. 44

In this example, the required initial slope (a) for the modified curve is -1.8 and that for the terminal value (v) is .10. The two base curves are A1 and A2, and the corresponding modifying lines are B1 and B2. The two resultant curves, C1 and C2, almost but not quite coincide.

The computation of the limits shown graphically in Figure 43 is rather intricate and consequently a brief tabulation is

given below:

a	v		a	v	
	Add.	*Mult.*		*Add.*	*Mult.*
−1.0	.60923	.36788	−2.2	.30502	.11080
−1.2	.54743	.30119	−2.4	.26857	.09072
−1.4	.49034	.24660	−2.5	.25168	.08208
−1.5	.46349	.22313	−2.6	.23568	.07427
−1.6	.43773	.20190	−2.8	.20612	.06081
−1.8	.38942	.16530	−3.0	.17970	.04979
−2.0	.34525	.13534	−3.5	.12584	.03020

These are the maximum possible values of v under the two methods of modification for the given values of a.

432—Additive Modification

The method of additive modification may be illustrated by the case in which a value of .10 is selected for v and a value of −1.8 is selected for a, or twice the linear slope for a terminal value of .10. Reference to Figure 43 shows that these values are compatible and a solution therefore is possible.

The equation for the slope of this modified curve has been given as:

$$z=(2.302585093 \log k)k^x-(k-v).$$

When $x=0$, z will be the initial slope a and the equation becomes:

$$2.3052585093 \log k-k+v=a$$

or

$$2.302585093 \log k-k=a-v.$$

Substituting the selected values of a and v, we have

$$2.302585093 \log k-k=-1.8-.10=-1.90.$$

The value of k is then computed from this equation.

This is a transcendental equation, however, and cannot be solved by algebraic operations. A number of methods of solution are available, but the simplest is to use a table of logarithms and an electric calculating machine. By assuming successive value for k a solution can usually be obtained in from 5 to 10 tries. (In making the calculations the actual *negative* logarithm for a quantity less than unity must be used. Tables of logarithms give only positive mantissas and the logarithm of a quantity less than unity is usually given by combining a negative characteristic and a positive mantissa. Thus the logarithm of .107 is usually stated as 9.02938 −10 or simply as 9.02938. Actually the logarithm of .107 is −.97062. It may be obtained by simplifying the conventional figure; here −10+9.02938=−.97062.)

In this case a value of .178863 is found for k and equations of the curve and its slope are:

$$y=(.178863)^x-(.178863-.10)x$$
$$=(.178863)^x-.078863x$$
$$z=-1.721135(.178863)^x-.078863$$

It is a simple matter to prove that the curve satisfies Conditions I, II, and III. When $x=1$, $y=.10$ (I). When $x=0$, $z=-1.8$ (II). And when $x=1$, $z=-.38671$ showing that the terminal slope is still negative (III).

The ordinates of the curve are computed with the aid of a table of logarithms.

433—Multiplicative Modification

The method of multiplicative modification may likewise be illustrated by the case in which $a=-1.8$ and $v=.10$. A glance at Figure 43 shows that these two values are compatible for this type of modification.

When $x=0$, the equation for the initial slope of this curve (see the general equation) becomes:

$$2.302585093 \log k-\left(1-\frac{v}{k}\right)=a$$

or

$$v=[(a+1)-2.302585093 \log k]k.$$

When $v=.10$ and $a=-1.8$

$$(.8+2.302585093 \log k)k=-.10.$$

The value of k is then computed from this equation.

This again is a transcendental equation and must be solved by successive tries using a table of logarithms and a calculating machine. In this case it will be found that two values for k less than unity will satisfy the equation; these are $k=.042334$ and $k=.33267$. This means that there will be a low base curve modified upward and a high base curve modified downward, or the situation shown in Figure 44.

The equations for the two resultant curves and their slopes are found to be:

$$y_1=(1+1.36217x)(.042334)^x$$
$$z_1=[-(1+1.36217x)3.16217 +1.36217](.042334)^x$$

and

$$y_2=(1-.69940x)(.33267)^x$$
$$z_2=[-(1-.69940x)1.10060 -.69940](.33267)^x.$$

Both curves are readily shown to satisfy Conditions I, II, and III. Again, when $x=1$, $y=.10$ in both instances (I). When $x=0$, $z=-1.8$ (II). And when $x=1$, $z_1=-.25855$ and $z_2=-.34273$, showing that the terminal slopes are negative and that the curves have been negative throughout (III).

The ordinates of the two curves are computed by means of a table of logarithms.

440—CURVILINEAR MODIFICATION

The exponential curve can be modified by an infinite variety of curves as well as by straight lines. The subject, therefore, is inexhaustible and should be ventured into only by those equipped with an adequate knowledge of mathematical analysis.

Only a single example of multiplicative curvilinear modification therefore will be given here. To make matters as simple as possible the terminal value (v) will be taken as zero. The base curve (A) is the exponential curve $y=(.1353353)^x$ that has an initial slope of -2.

Two examples of modifying curves are given together with an example of linear modification for comparison. The three modifying lines (B) then are:

B1	The quadratic concave upward curve presented in Part III	$y=(1-x)^1$
B2	The straight line	$y=1-x$
B3	The quadratic concave downward counterpart of B1	$y=1-x^2$

These modifying lines and the resultant curves (C) are shown in Figure 45.

The effects of these modifications on the initial slopes are shown on the following page.

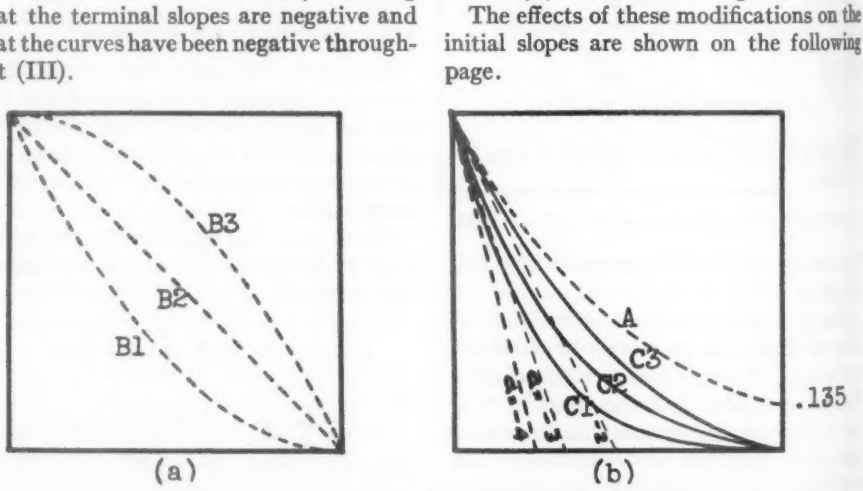


FIG. 45

	Initial Slopes		
	A	*B*	*C*
1. Quadratic—CU	−2	−2	−4
2. Straight line	−2	−1	−3
3. Quadratic—CD	−2	0	−2

The concave downward quadratic curve has an initial slope of zero and therefore does not change the initial slope of the base curve (A). This fact has some value in certain applications but this modifying curve should not be used without discrimination where the facts of the problem do not warrant its use.

The computation of the ordinates of these resultant curves is very simple:

		1		*2*		*3*	
x	*A*	*B1*	*C1*	*B2*	*C2*	*B3*	*C3*
0	1.00000	1.00	1.00000	1.0	1.00000	1.00	1.00000
.1	.81873	.81	.66317	.9	.73686	.99	.81054
.2	.67032	.64	.42900	.8	.53626	.96	.64351
.8	.20190	.04	.00808	.2	.04038	.36	.07268
.9	.16530	.01	.00165	.1	.01653	.19	.03141
1.0	.13534	.00	.00000	.0	.00000	.00	.00000

450—CONCLUSIONS

Whether accountants like it or not this is it. The control of the exponential curve requires the mathematics outlined in the foregoing. And anyone who takes the trouble to work out a particular solution will find that he has let himself in for a lot of drudgery. On the other hand, any attempt to base a depreciation scheme on an uncontrolled curve is a confession of ignorance and ineptitude, for the tool is then the master of the man. A controlled curve satisfies preselected conditions derived from factual data, whereas an uncontrolled curve is a self-induced delusion unrelated to any experience with depreciable assets.

To sum up, the exponential curve is a relatively intractable and complex non-algebraic curve without any particular merits to commend it. Although it is susceptible to modification and control, as is any curve, the work involved therein is out of all proportion to the results obtained. And even when an equation for a controlled exponential curve has been arrived at, there still remains the labor of computing the ordinates of the curve, which requires the use of a table of logarithms. The mathematics involved in stating, modifying, and computing a controlled exponential function is beyond the range of the majority of accountants and the curve should be abandoned for accounting purposes. Anything that the exponential curve can do may be done far more simply and with much less effort by polynomial functions, particularly the quadratic.

THE TEACHERS' CLINIC

A. B. CARSON

EDITOR'S NOTE: This section of THE ACCOUNTING REVIEW is devoted to matters of particular interest to accounting instructors. The contribution of articles bearing on the nature and purpose of various types of accounting education, or dealing with techniques of accounting instruction, is invited. Address all correspondence to A. B. Carson, School of Business Administration, University of California, Los Angeles 24, California.

TRY THIS ON YOUR CLASS, PROFESSOR

RAYMOND P. MARPLE

Assistant Secretary, National Association of Cost Accountants

Teachers are always looking for questions and problems which will test the students' ability to reason. In teaching accounting, it is not difficult to develop problems and situations which test the students' ability to apply theory to specific situations; it is more difficult to develop problems and situations which deal with the basic postulates which underly our accounting practices. The following related problems are offered as means of stimulating student (and teacher) thinking on the "why" rather than the "how" of certain accounting practices.

THE ALL FIXED COMPANY CASE

The students of today will be the practitioners of tomorrow. If today's training is to prepare them for their future work, it must recognize the current trends which are likely to be most influential in changing our accounting practices. One of these is the trend toward a constantly increasing proportion of fixed to total costs. Is it possible that in the future, for some companies at least, all costs may be fixed? Let's assume that it is and ask our students to consider the case of The All Fixed Company. Suppose you present it to the class in this way:

"The year is 1975. This is an important year for accountants because this is the year that The All Fixed Company begins operations. The company is so named because it has no variable costs—all of its costs are fixed and vary with time rather than output.

"The All Fixed Company is located on the bank of a river and has its own hydroelectric plant to supply power, light, and heat. The company manufactures a synthetic fertilizer from air and river water, and sells its product on a long-term, fixed-price contract. It has a small staff of employees, all hired on an annual-salary basis. They find this arrangement better than the more general guaranteed annual wage of 1975. The output of the plant can be increased or decreased by adjusting a few dials on a control panel."

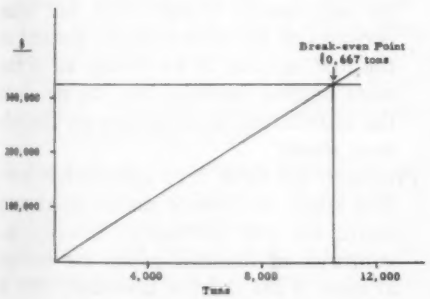
Now place on the blackboard the following data regarding the first month's operation by The All Fixed Company:

Sales	10,000 tons
Production	20,000 tons
Selling Price	$30 per ton
Costs (all fixed)	
Production	$280,000
General & Administrative	$ 40,000

Ask the students to prepare an income statement for the first month's operations. Since we can assume that you have trained them well in orthodox, conventional, 1956-absorption costing methods, the chances are that there will be general agreement among them that the company earned $120,000 during the first month of operation and that the income statement should read something like this:

Sales	$300,000
Cost of Goods Sold	140,000
Gross Profit	$160,000
General & Administrative Expenses	40,000
Net Profit	$120,000

At this stage your students are likely to feel that, while the case of The All Fixed Company is unique, the problem you have asked them to solve is far too simple for students of their mentality and training. This attitude should be corrected. It can be, readily, if there has been some prior consideration in the class of break-even charts and break-even analysis. Just ask the class to prepare a break-even chart for The All Fixed Company, based on the first month's results. This will not prove too difficult for them once they realize that there are no variable costs to be plotted, and most of them will come up with a break-even point of 10,667 tons per month and the following chart:



At this point, it is likely that one of your brighter students will save you the necessity of pointing out that there must be some error—that a company with a break-even point of 10,667 tons should not show a profit on sales of 10,000 tons.

Now you have the students interested and intrigued. What's the next step? Should you encourage full and free class discussion with a minimum of guidance on your part? Should you endeavor to guide them to an answer by a series of directed questions? Or should you use the opportunity, now their interests are aroused, to recite the facts relating to the second month of operation of The All Fixed Company in the hopes that this will help them in analyzing the problem? Let's assume you adopt the latter course and tell your class:

"During the first month of operation, the management of The All Fixed Company learned that the product had a tendency to deteriorate somewhat in storage. It adopted the policy, effective with the beginning of the second month, of producing only as the product was needed to fill sales. During the second month sales were the same as for the first month (10,000 tons) and were filled entirely from inventory. Costs, being fixed, were the same as for the first month. Prepare an income statement for the second month's operation."

By this time the students will realize that there is more to the problem than they thought originally and will be less sure that the answer each develops by applying absorption costing methods is the right one. But some brave soul, who has complete confidence in what you have taught him, will almost certainly come up with a statement which will read like this:

Sales		$300,000
Cost of Goods Sold		140,000
Gross Profit		$160,000
Unabsorbed Production Cost	$280,000	
Genl. & Admin. Expenses	40,000	320,000
Net Loss		$160,000

Now is the time for the directed questions. Let's listen in on the class discussion:

Professor: Does it seem logical that a company with $300,000 sales in each of two months should have a profit of $120,000 one month and a loss of $160,000 the next?

Student: Well, sales were the same, but production wasn't. When you don't produce there are no products to charge the expenses to, so you charge them against income. That's what happened the second month.

Professor: That's right, but if you were the President of The All Fixed Company, what would you think when your accountant said that the profit of $120,000 for the first month had been turned into a loss of $160,000 the next?

Student: I'd think that the accounting was cockeyed. Isn't it a fundamental principle of accounting that a profit shouldn't be taken until it is realized through sales? In other words, shouldn't profit vary with sales, with some allowance for differences in costs? In this case, the costs were the same each month. All that's happened is that all the product sold in two months was produced in the first month. The profit figures don't make sense.

Student: And they don't jibe with the break-even chart, either.

Professor: A break-even chart is based on the theory just expressed—that profits vary with sales volume. Can someone tell us what the profit should be on $300,000 sales, based on the break-even chart?

Student: The break-even point is 10,667 tons, but sales were only 10,000 tons. Sales were 667 tons less than needed to break even, so there was a loss.

Professor: And, translated into dollars?

Student: For every ton they failed to sell below 10,667 tons they lost $30. 667 tons times $30 amounts to $20,000. The net loss for the two months was $40,000, or $20,000 a month.

Professor: So it begins to appear that our error is in the shifting of profits—or losses in this case—between the two months. Anyone have an idea as to what is wrong?

Student: I do. All of the costs of this company are fixed. I've been reading ahead a little in our textbook and the author says that some accountants think of fixed costs as costs of the period rather than costs of the product. Period costs, he says, should be charged against the income of the period rather than charged to inventories like variable or product costs. Would that solve the problem?

Professor: Well, let's see if it would. If you will change your statement for the first month to deduct from the sales of $300,000 the fixed production costs of $280,000 and the fixed general and administrative expenses of $40,000, you will have a net loss of $20,000. That agrees with our break-even chart. Since the sales and the costs are the same for the second month as for the first, the statements and profit for each month would be the same. Does that make sense?

Student: It makes sense so far as the loss for each month is concerned, but what becomes of the inventory at the end of the first month? If we charge all of the costs against income, how do we show the 10,000 tons in inventory on the balance sheet?

Professor: All right, let's approach it from that angle. Let's see if we can agree on a figure for the inventory. Usually, inventories of finished goods are carried at cost. What did the inventory cost in this case?

Student: It was half of the month's production, and the production cost was $280,000, so I'd say the inventory cost $140,000.

Professor: Let me state the question another way. To take care of sales the company would have needed a production of 10,000 tons. In addition, it produced 10,000 tons for inventory. How much additional did the 10,000 tons for inventory cost?

Student: I see what you mean. Since all production costs are fixed, it didn't cost anything additional to produce the 10,000 tons for inventory.

Professor: That's right. And how were the costs of the second month affected by the fact that the product sold that month was produced in the first month?

Student: They weren't changed, because all of the costs are fixed.

Professor: Right again. Now, if production of goods in one month doesn't increase the costs in that month, or decrease the costs in the succeeding month when they are sold, why should any of the costs of the first month be charged to inventory and carried forward as a charge of the second month?

Student: They shouldn't be if they are fixed costs. As I see it, fixed costs like rent, insurance and depreciation go on month by month and are not increased when production is increased, or decreased when production is decreased. They're costs of the period rather than costs of the product, and should be written off currently and not charged to inventory. But how about variable costs like material and labor?

Professor: Variable costs are caused by production. They increase as the number of units produced increases. Variable costs incurred this period save making the same expenditures next period. Accordingly, such costs can be deferred in inventory until the product to which they apply is sold. But in The All Fixed Company all of the costs are fixed.

Student: But how about the inventory on the balance sheet? Certainly the 10,000 tons of fertilizer have some value. They can be sold, can't they?

Professor: Presumably they can be sold—in time. But as time passes, additional fixed costs accrue. Isn't it logical to say that the inventory of 10,000 tons of fertilizer has no value to The All Fixed Company? No extra costs were incurred in the first month to produce it, and its production in the first month did not save any costs in the second month. Isn't it logical to say that the only value an inventory has to a company is measured by the costs which will be saved in the future?

Student: Perhaps it doesn't have a value in that sense to the company. Doesn't it have a market value? Wouldn't farmers pay something for 10,000 tons of fertilizer?

Professor: We can assume that that is the case. Yet, the fact remains, that the company sold only 10,000 tons in the first month, and an additional 10,000 tons the second month. Whatever the reason for the sales volume, the fact remains that the possession of 10,000 tons of fertilizer at the end of the first month did not result in any reduction of costs in the second month. Therefore, can't we say that the worth of an inventory at the end of an accounting period is measured by the costs which will be saved in a future period? Isn't this the same principle which is applied in the "cost or market, whichever is lower" rule? If we have raw material in inventory, purchased at one price, and the market price at the end of the period is lower, we write the inventory down to the market price. At the time of the write-down the market price measures the future costs which have been saved because the raw material had been obtained in advance of its use. The inventory of The All Fixed Company had no value at the end of the first month because its production in advance of sale did not save any costs for the second month.

Class dismissed.

THE SEMI-FIXED COMPANY

Some students may discount the conclusions reached in The All Fixed Company case on the ground that it is engaging in fantasy to think of a company all of whose costs are fixed. For the benefit of such, and as a means of further illustrating the principle involved, it is suggested that the case of The All Fixed Company be followed at a subsequent meeting of the class by consideration of the case of The Semi-Fixed Company.

This company begins operations in 1965 and differs from The All Fixed Company in only one respect—it has both fixed and variable production costs. Its variable costs are $7 per ton and its fixed production costs $140,000 a month. Normal capacity is 20,000 tons per month.

First ask the class to prepare income statements for the first and second month based on conventional absorption costing. You can expect the following:

First Month		
Sales		$300,000
Cost of Goods Sold		140,000
Gross Profit		$160,000
General & Administrative Expense		40,000
Net Profit		$120,000
Second Month		
Sales		$300,000
Cost of Goods Sold		140,000
Gross Profit		$160,000
Unabsorbed Fixed Costs	$140,000	
Genl. & Admin. Expense	40,000	180,000
Net Loss		$ 20,000

Discussing with the students the reason why the loss for the second month is different from that reported originally for The All Fixed Company will help to bring out the difference between fixed and variable costs.

You are now ready to ask the students to apply what they learned at the previous session by asking them to prepare income statements on a direct costing basis for The Semi-Fixed Company. They should not find this too difficult if you suggest that the first step is to deduct variable cost of goods sold from sales to arrive at marginal income. The statement should read as follows:

First Month		
Sales		$300,000
Variable Cost of Sales		70,000
Marginal Income		$230,000
Fixed Production Costs	$140,000	
Genl. & Admin. Expense	40,000	180,000
Net Profit		$ 50,000

Second Month
(Same as First Month)

Now we're ready for discussion. Let's listen in.

Professor: You will observe that The Semi-Fixed Company earned a profit of $100,000 during the two months period, while The All Fixed Company suffered a loss of $40,000. Why was this?

Student: Because some of the costs of the second company were variable costs. They could be eliminated when the plant shut down for the second month.

Professor: Right. You will recall that last session we calculated the loss of The All Fixed Company as $20,000 each month. Today, we have calculated the profit of The Semi-Fixed Company as $50,000 each month. This is a profit improvement of $70,000 *each* month. How do you explain the fact that there was a profit improvement each month, yet the saving came from not operating the plant in the second month only?

Student: Is it because variable costs differ from fixed costs?

Professor: That's right—but how?

Student: We concluded last session that none of the cost of The All Fixed Company should be charged to inventory because they were all fixed costs. Today,

in the case of The Semi-Fixed Company, we have charged all of the fixed costs against income but we have divided the variable costs between inventory and cost of goods sold. So really we have deferred in inventory $70,000 of the variable costs of the first month.

Professor: Which again illustrates the difference between variable costs and fixed costs. Variable costs are out-of-pocket costs which are caused by and tend to vary with production. They can be incurred in advance and stored up. When The Semi-Fixed Company paid $70,000 for the direct material, direct labor, and variable expenses to produce 10,000 additional tons of fertilizer during the first month for sale in the second month, it saved that amount of cost in the second month. So it is logical to defer such costs as inventory until the second month when the product is sold.

Student: Professor, could you give us a general statement which would summarize what we have been discussing the last two sessions?

Professor: I'll try to. Let's state it this way: In the determination of periodic profit, the only costs which should be deferred in inventory for application against the future are those costs which, because they have been incurred in the past, will not have to be incurred in the future.

Students: (In chorus) Thank you, Professor.

THEORY CASES FOR UNDERGRADUATE COURSES

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AND
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The current and usual criticism of accounting graduates as being deficient in the ability to communicate ideas whether orally or in writing, the emphasis on matters of theory in professional literature and examinations, and the general desirability of helping students to look beyond textbook problems all suggest the importance of the possibility of using additional materials in undergraduate courses which will give the student an opportunity and a stimulus to think about and to discuss questions of theory aside from the necessity of making journal entries or worksheet adjustments. If possible, we in the teaching profession should give our students experience in analyzing situations and evaluating alternative accounting treatments considered as acceptable in those situations. If at all possible we should give them some idea of the world that lies beyond the textbook, the real world where actual transactions are dealt with, the world of business in which patterns change and transactions are complex indeed, where all the facts necessary for a cut and dried solution are not immediately apparent, and where sometimes something less than the most desirable treatment is accepted.

After some experimentation, the writers have found a means of achieving, in part, some of these goals. In a two-hour undergraduate course called "Current Accounting Topics" an effort is made to give the students something other than conventional text-book material and to encourage the discussion of matters of theory in

a framework that differs from the usual problem-solving approach. This course is handled in a way that requires considerable oral and written expression by the student. Although several methods have been attempted, the most successful has been a case approach. This, however, is not just another argument for the case approach to the teaching of accounting. The writers feel strongly that the case approach has serious limitations in a field where a complex methodology is so important. The use of cases can be very effective, however, as a supplementary method of teaching to offset some of the weaknesses of the customary problem approach.

The cases used as supplementary materials in "Current Accounting Topics" are based on illustrations selected from the actual business world. From reading assignments and classroom discussion in other courses the students get the theoretical approach to the solution of a great many problems; in this course they are then given a case or cases taken from a particular firm or firms showing how these problems were actually handled in practice. When they see how the problem was actually handled, and knowing the theoretical basis on which it should have been handled, the creation of discussion is a very simple matter.

Depending upon the complexity of the question raised, one of two methods of presentation is used. For interesting points or problems which are neither too complex nor too difficult for the students to grasp without prior consideration, but which the instructor feels should be brought to their attention, an opaque projector and screen which permits the reproduction of practically any desired material without the use of a preliminary duplicating process of any kind is used. For example, one can reproduce a balance sheet, an income statement, or notes to financial statements merely by using the report itself in conjunction with the projector. Since the classroom must be darkened for a projection of this kind, the student's attention is focused on the screen, and as a result his interest is held reasonably well. In fact it has been the writers' experience that some students find it less embarrassing, or at least easier, to express their opinions under such circumstances than otherwise. If the problem under consideration is sufficiently complex to require that the students be given an opportunity to study it at length before discussion, the necessary material may be mimeographed, together with instructions, and distributed sometime in advance of the meeting at which the case is to be discussed.

Usually, one of the big problems in case preparation is that of cost. However, the cases which are used in this course are both inexpensive and reasonably easy to obtain. Most of them come directly from published annual reports of corporations or from listing applications filed with the Department of Stock List, New York Stock Exchange. Such materials are readily available, free of charge, upon request. The writers currently receive annual reports from about one hundred business corporations, the initial requests for such reports being prepared from an index of companies listed on the New York Stock Exchange, and are also on a mailing list that provides copies of all listing applications filed with the New York Stock Exchange. Reasonably careful reading of these materials as they come in often gives leads from which to develop cases.

For example, a few years ago a number of companies came out at about the same time with variations of the old stock dividend and stock split transactions, variations that were not discussed, or even mentioned, in textbooks. Such transactions were disclosed in statements of retained

earnings and of capital surplus and often were described further in notes to the financial statements or in the president's letter included in the annual report. By selecting excerpts from four or five annual reports it was possible to draw together a variety of such transactions. These excerpts, together with some very brief introductory materials and some simple instructions, made up a case. The student was required to review the financial statement disclosure of the transactions as reproduced in the mimeographed case and arrive at a conclusion as to whether the accounting treatment in each instance was satisfactory. This resulted in considerable discussion by the class, leading to a complete exploration of the distinction between stock dividends and stock splits as currently explained in textbooks and the difference between that distinction and the one apparent in the handling of the transactions in question. Now that the American Institute of Accountants has published an Accounting Research Bulletin on this subject, a reference to that material is included as part of the case. This requires the student to read current professional writing as well as textbook reference material.

Cases which are currently being used may be grouped into three categories or types. First, there are those in which a single point in a particular report or listing application is sufficient to raise an interesting question for discussion. The question may be one of adequacy of disclosure, of propriety of treatment accounting-wise, of consistency with what the company does in respect to similar problems, or something of this kind. The treatment by the du Pont Company of its investment in stock of General Motors is an illustration.

A second type of case is similar to that discussed with respect to stock dividends and stock splits. Here the varying treatments of apparently similar problems by different companies are brought together for comparison. These cases require considerable skill on the part of the instructor in controlling the discussion so that he will not appear to condemn any given company for its accounting. Frequently he must use his imagination in an attempt to point out some of the circumstances which might justify the selected treatment and which might not be apparent from the available materials. These cases are particularly useful in pointing out that there are acceptable alternatives and that all facts should be considered before an unfavorable decision is reached with respect to any given treatment.

The third type of case which has been found to be successful is one in which successive reports of a given company have dealt with a continuing problem. An illustration of this is the treatment of the goodwill arising out of the purchase of the Toni Company by Gillette Safety Razor Company. Incidentally, this is also, in the writers' opinion, a classic case with respect to the disposition of goodwill. In 1948 when Gillette purchased all of the outstanding stock of Toni it paid $8,000,000 for goodwill. In addition it agreed to pay, after profits equal to the original payment for goodwill had been earned, one-half of the subsequent profits until an additional $8,000,000 had been paid. Thus there was both goodwill and contingent goodwill involved in the purchase. Every annual report from 1948 until 1954 has had more to do with this problem. To draw the pertinent extracts from the financial statements, footnotes, and president's letter in the successive reports and then place them before the student gives him an intriguing problem that he would not believe possible if stated in textbook terms.

Cases of this type often grow out of a single item in an isolated report. Some-

times, to get the background for current treatment of some special item, it seems desirable to refer to previous reports of the same company. In so doing leads may be obtained which, after scanning an entire series of reports, help to piece together a long and involved story.

Not uncommonly a given company seems to have a history of "unusual" accounting problems which, when thoroughly analyzed, make excellent cases. The Gillette Company, for example, in addition to the goodwill problem mentioned above, has had some quasi-reorganization problems that are most useful in pointing out to students the evolution that has taken place in the quasi-reorganization concept. Incidentally, Gillette's amortization of the goodwill created by the Toni purchase and of other intangibles can also be tied into their quasi-reorganization history, which in itself presents still another interesting question for discussion from the standpoint of accounting theory.

In our opinion most cases can best be prepared by the instructor himself. The use of others to prepare cases has not been particularly successful, chiefly because it is very easy for one to become so interested in the materials under surveillance that he forgets all about the preparation of cases. The instructor has a further advantage in that he is more familiar with the sort of material he can use and is, therefore, more likely to recognize the possibilities for discussion in an item that someone else might overlook.

Although it may be necessary for the instructor to build up at least a small file of annual reports before he can develop any significant number of cases, this should not be considered a deterrent if one sees value in the case approach. Since many libraries receive and file annual reports, and since many investment firms are cooperative in making such materials available, one may have a larger supply of material at hand than is frequently realized. In order to encourage others to experiment with this method of teaching accounting theory and at the same time to add to their own file of material, the writers will be more than happy to trade ideas regarding cases with anyone who is interested.

A SIMPLIFIED THREE-VARIANCE TECHNIQUE

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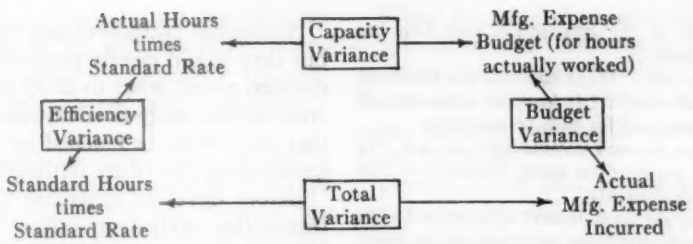
The basic concepts involved in calculating the three components that make up the difference between manufacturing expenses incurred and the amount that is charged to production under a standard cost system are difficult matters for most students of cost accounting. In the opinion of the writer, this difficulty is due largely to the complexity of the mathematical examples presented in most cost-accounting textbooks, and to the absence of a short but comprehensive method of linking the three variances together.

Not all textbooks treat the subject in the same way, but many of the books that are widely used show how the difference between incurred and applied burden can be analyzed into efficiency, capacity, and budget variance. In most cases, too little emphasis is placed on the point that these three are really just segments of the one total difference or variance. To assist students in their comprehension of these relationships, the following diagram has been developed:



The diagram is easy to put on a blackboard and, what is more important, it is easy for the students to remember. It illustrates the point that the three parts are equal to the whole variance even though some of the components may be favorable or positive, while others are unfavorable or negative. The use of the diagram can be effective in aiding understanding and combating the tendency of students to simply memorize formulae.

HELPING ACCOUNTING STUDENTS TO LEARN HOW TO ANALYZE A BUSINESS TRANSACTION

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Many students of elementary accounting experience considerable difficulty in learning how to analyze business transactions. This is especially true for those students who have not studied bookkeeping prior to taking the first college accounting course. Most students who have studied bookkeeping in high school or have even a limited amount of bookkeeping experience very quickly recall the principles of debit and credit in double-entry bookkeeping and can analyze typical business transactions correctly with apparent ease.

This teacher has been more than a little concerned, however, about the fact that far too many students in the typical college elementary accounting course are left at the "starting gates" because of their failure to grasp quickly the fundamental ideas of transaction analysis. It is normally impossible, because of the press of time, to proceed with the class as a whole at the pace of the slow learners. Furthermore, if this is done, the good students soon become bored and may lose some of their initial enthusiasm for the course. Also, it would probably result that the slow students would not show sufficient improvement to justify devoting three or four extra class sessions to this topic.

What is the best solution to this problem? The author has come to the conclusion that the only real solution is to insist that the weak students get plenty of individual instruction on the theory of debit and credit and the fundamentals of transaction analysis. Since additional class time cannot be devoted to this, the best alternative is to require selected students to meet with the instructor, individually or in small groups, and to drill on transaction analysis following a logical step-by-step procedure.

Following is a procedure which the author has found to be very helpful in working with any student showing a weakness in this area:

Step 1: Ask the student, "What happened in this transaction?" (The student should state, in his own words, what the given state-

ment of the transaction tells him has happened.)

Step 2: Then ask, "What accounts are involved, or affected?" (*At least two* accounts will be involved for each transaction.)

Step 3: Then *for each account affected*, ask, "Is this account an asset, liability, or net worth account?"

Step 4: Then *for each account affected*, ask, "Is this account being increased or decreased, and how much?"

Step 5: Using this diagram as a guide, decide whether each account should be debited or credited.

Asset Accounts		Liability Accounts		Net Worth Accounts	
Debit	Credit	Debit	Credit	Debit	Credit
+	−	−	+	−	+

Step 6: After applying Steps 3, 4, and 5 for each account involved, a final check is to see if the total amount of the debits is equal to the total amount of the credits.

To illustrate the application of this procedure let us take one transaction and develop the transaction analysis in the six-step sequence given above.

Transaction: Purchased office equipment on account from Modern Equipment Company, $1,800.

Application of the analysis procedure:

Step 1: We acquired office equipment; we owe $1,800 to Modern Equipment Company.

Step 2: Accounts affected are Office Equipment and Accounts Payable (Modern Equipment Company).

Then, for *Office Equipment*,

Step 3: Office Equipment is an asset account.

Step 4: This account is being increased $1,800.

Step 5: The Office Equipment account will be debited $1,800 because an increase in an asset account requires a debit.

And, for *Accounts Payable*,

Step 3: Accounts Payable is a liability account.

Step 4: This account is being increased $1,800.

Step 5: The Accounts Payable account will be credited $1,800 because an increase in a liability account requires a credit.

Step 6: (*Final check*) Yes, the debit amount of $1,800 equals the credit amount of $1,800.

Additional examples could be given here but they would merely emphasize that the decision about what to debit and what to credit in the analysis of a business transaction can always be reached by the six-step questioning procedure outlined above.

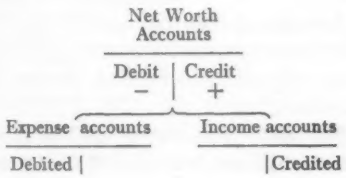
Before devoting extensive time to the transaction analysis procedure it is advisable to make sure that each student seeking help knows the debit and credit rules for increases and decreases as shown by the diagram in Step 5 above. This is, of course, a fundamental which the student should memorize. Also, the student should have at his command a knowledge of several typical accounts which would be affected by the transactions on which he is to drill. He should be required to list several asset accounts, two or three liability accounts, and the principal net worth accounts. In other words, he should be encouraged to develop at least a limited vocabulary of account titles, such as Cash, Accounts Receivable, Land, Buildings, Office Equipment, Accounts Payable, Notes Payable, Proprietor's Capital account, etc.

After the student who has shown weakness in the analysis of business transactions has received considerable drill under the personal tutelage of the instructor, as outlined above, he should find that the decision as to what account to debit and to credit for any simple business transaction is reached without great difficulty. After extensive drill, many a student who was slow at first, should discover that the six steps can really be carried out in one short thought process, and the final answer may be on the tip of his tongue almost as soon as he has read and comprehended the business transaction given in the problem.

It is imperative that students who have difficulty with the analysis of simple business transactions be "spotted" by the instructor without delay. The reason for this is rather obvious. After transaction analysis is first introduced in the typical elementary accounting course, only a few

class meetings elapse before the students are expected to be able to handle more complex transactions, especially transactions involving income and expense accounts.

The analysis of transactions involving income and expense accounts need not be exceptionally difficult if the students are well schooled in the analysis of transactions involving only asset, liability, and the primary net worth accounts. This means merely that the diagram in Step 5 must be expanded to include income and expense accounts. It must be understood by the students that since incomes increase net worth, and since increases in net worth call for credits, then the income accounts should be credited for earnings of the business enterprise. On the other hand, since expenses decrease net worth, and since decreases in net worth are recorded as debits, expenses incurred by the business enterprise are debited to appropriate expense accounts. The net worth portion of the diagram shown above for Step 5 of the analysis procedure can therefore be expanded in this way:



When income and expense accounts are involved in the drill transactions, the question to be asked in Step 3 must be modified as follows: "Is this account an asset, liability, net worth, income, or expense account?"

It may appear that the reason some students do not quickly comprehend this basic and essential area of accounting is that they are not trying. Sometimes this is the case—some students undoubtedly do give up very readily. This teacher is of the opinion, however, that more often than not the lagging students are actually trying to learn but have not acquired the ability to think and learn in a logical manner. Too many students do attempt to memorize nearly everything that is new to them, and if memory fails them they are lost. Memory is very important, of course, but is only one of the steps, usually one of the first steps, in the learning process. In learning any new subject matter certain fundamentals must certainly be fully understood. But where application of these fundamentals is involved, one must be able to advance beyond the memory stage and think the problem through, step-by-step, to its best solution. The author has found the six-step procedure discussed above to be very helpful in showing many students how to approach the learning and application of transaction analysis in a logical manner.

PROFESSIONAL EXAMINATIONS

A Department for Students of Accounting

ACCOUNTING PRACTICE

HENRY T. CHAMBERLAIN

THE following problems were prepared by the Board of Examiners of the American Institute of Accountants and were presented as the first half of the C.P.A. Examination in accounting practice on May 9, 1956.

The candidates were required to solve problem one and any three of the remaining four problems. The total weight assigned to this section of the examination was 50 points and the suggested time allowances were as follows: problem one, 80 to 110 minutes; any three of the remaining four problems 120 to 160 minutes.

Number 1

Based on the information which follows, you are to prepare a joint return for Mr. John C. Scott and his wife Mabel for the calendar year 1955 on the Form 1040 and the separate Schedule D furnished you. Compute the minimum federal income tax liability by the regular method and by the alternative method. Compute the net tax payable or the overpayment refundable. Assume that they report on the cash basis. Fill in all possible lines on the return. A long-form tax rate table is shown on the back of Schedule D. Submit supporting figures and schedules in each case where items are not shown clearly on the return. Use the regular examination paper for such figures and schedules and *key* them to the tax return.

Mr. John C. Scott, a citizen, resides at 145 Oakview Lane, Pittsburgh 50, Pa. He is 63 years of age, and his wife, Mabel, is 66. Both have good vision. Their one child, Howard, age 27, is in his third year of full time graduate study at the University of Pittsburgh. Howard was supported in 1955 as follows.

By earnings from a part-time job	$ 700
By father	1,000
	$1,700

Mrs. Scott has not worked (except as a housewife) since 1950. From 1940 to 1950 she earned $1,000 per year rom a part-time secretarial position. Her only 1955 income is $600 of social security benefits and $1,500 of dividends.

Mr. Scott entirely supported Mr. R. R. Smith, age 80. Mr. Smith's wife, who died five years ago, was the sister of Mr. Scott's mother. Mr. R. R. Smith had no gross income and has lived in the residence of Mr. and Mrs. Scott for the past five years.

Mr. Scott has been controller of the Johnson Manufacturing Company in Pittsburgh, Pa., since April 1, 1955. His gross salary for the nine months was $27,000 ($3,000 per month). Among his payroll deductions were $7,000 withholding tax and $84 F.I.C.A. He also received an expense allowance of $250 per month for the nine months, out of which he expended $1,500 for travel, meals, and lodging while away from home on company business. Mr. Scott was ill with bronchial pneumonia which developed from a cold. As a result he was absent from work for three full weeks in November. He spent five days in the hospital during the second week of his illness. He continued to draw full pay in accordance with the company's wage continuation plan.

Prior to employment with the Johnson Manufacturing Company, Mr. Scott had been assistant controller with the Elaborate Foundry Company in St. Louis. His gross salary there for 1955 had been $7,200 (3 months at $2,400 per month). Among his payroll deductions were $1,800 withholding tax and $84 F.I.C.A.

Mr. Scott paid $800 for moving expenses from St. Louis to Pittsburgh. In addition, he made a profit of $3,000 on the sale of his former residence in St. Louis. The basis of the old residence was $25,000 (purchased on January 5, 1945) and the adjusted selling price was $28,000 (sold on February 20, 1955). His new residence purchased in Pittsburgh on April 1, 1955, cost $24,000. In May of 1955 he added a room on to his new residence at a cost of $3,000.

In addition to his position as controller of the Johnson Manufacturing Company, Mr. Scott operates a television repair shop as sole proprietorship under the name of Scott Electronics Shop. The books are kept on the accrual basis and net income before taxes for 1955 was $3,000. (Do not prepare separate Schedule C, but simply enter $3,000 in the proper place on page 1 of Form 1040.)

Mr. Scott held the fellowing bonds during the entire year. All bonds were purchased at par and are in his name only.

Description	*Date Issued*	*Principal*	*Interest Rate*	*Interest Received*
AB Corporation Bonds	7-1-39	$10,000	4%	$400
CD Corporation	1-1-25	6,000	3%	180
Port of New York Authority Bonds	12-1-48	4,000	2%	80
Borough of Bellevue Bonds	6-1-45	5,000	1½%	75
Pennsylvania Railroad Bonds	5-1-30	9,000	3%	270

Mr. Scott received gross income of $500 on an investment in a foreign country, which income is also subject to U. S. income tax. Mr. Scott is entitled to a $50 credit for tax paid a foreign country. Show the income in Schedule H, line 3. Do NOT take time to attach a Form 1116.

Mr. and Mrs. Scott each received cash dividends of $1,500 (a total of $3,000) from qualifying domestic corporations during 1955.

Mr. Scott had previous family connections in Pittsburgh prior to April of this year. On March 1, 1915, Mr. Scott's father acquired a brick store building in Pittsburgh at a cost of $75,000 of which $60,000 represented the cost of the building and $15,000 the cost of the land. Estimated life of the building from March 1, 1915 was 50 years. Mr. John C. Scott received the property as a gift from his father on March 1, 1935, when the fair market value was $40,000, of which $28,000 related to the building and $12,000 to the land. Estimated life of the building from March 1, 1935 was 28 years. Mr. Scott sold the property on March 1, 1955 for $31,560 net; $13,560 for the building and $18,000 for the land. During the first two months of 1955, Mr. Scott received rental income of $1,250. The lessee paid all expenses except certain repairs amounting to $150 and deductible allocable property taxes of $200, which were paid by Mr. Scott.

Mr. Scott won $115 on the horse races at Wheeling Downs in 1955 due to tips from a friend named George. He did no other gambling during the year.

While making a speech on the evening of June 14, 1955, at Soldiers and Sailors Memorial Hall, Mr. Scott's personal automobile, which he had purchased only five months before for $3,000 cash, was stolen. The automobile was never recovered and the insurance company paid Mr. Scott $2,300 in full settlement on December 16, 1955. Fair

market value of the automobile immediately before the theft was $2,500. Mr. Scott received an honorarium of $25 for the speech.

Mr. Scott replaced one of the most vital pieces of testing equipment owned by the Scott Electronic Shop. On October 15, 1955, he sold for $300 cash, a piece of equipment which had cost him $500 on May 15, 1955. Allowable depreciation for the intervening months was $50. He then purchased a new and more modern piece of testing equipment for $700 cash.

The Scott's stock holdings and transactions were as follows:

Kind of Stock	*Date Acquired or Basic Date*	*Date of Sale*	*Cost or Other Basis*	*Selling Price*	*Expenses of Sale*
FF Co., Common (a).....	2- 5-51	6-11-55	$4,000	$10,000	$90
ZZ Co., Common (b).....	7- 2-55	—	500	—	—
HH Co., Preferred (c).....	?	12- 1-55	?	5,000	50
GG Co., Common (d).....	10-11-51	8-31-55	?	1,100	40

Notes on sales of stock:

(a) Purchased for cash February 5, 1951.

(b) Purchased for cash on July 2, 1955. On November 15, 1955, the ZZ Corporation was adjudicated bankrupt and the stock was worthless.

(c) The stock of HH Company was inherited from Mrs. Scott's father who had purchased it in 1918 for $6,000. The father died on March 1, 1954 at which date the stock was worth $4,000, and its fair market value when distributed by the executor on July 1, 1955 was $4,200. The executor made no election.

(d) Purchased 100 shares of GG Company common stock on October 11, 1951, for $8,800 and received certificate No. 18523.

On July 24, 1955, received certificate No. 29431 for 10 shares of GG Company common stock as a 10% stock divided on the common stock. Fair market value per share on this date was $85.00.

On August 31, 1955, sold certificate No. 29431 for 10 shares at $110 per share.

Mr. Scott made a $1,000 loan to A. Blade on December 8, 1954. On September 1, 1955 it was deemed worthless as Blade died after a long illness and left no estate.

There was no capital loss carry-over from prior years.

In addition to any allowable other *itemized deductions* you may discover in the preceding facts, Mr. and Mrs. Scott had the following allowable other *itemized deductions:*

Contributions.....	$1,850
Interest.....	1,200
Taxes.....	2,000
	$5,050

Mr. and Mrs. Scott on a joint declaration have made payments totaling $5,000 on their 1955 estimate (Form 1040 ES). Payments were made to the Director's office in Pittsburgh. Neither Mr. nor Mrs. Scott owe any prior years' Federal taxes. Their 1954 return was filed in St. Louis. If a refund is due, they want it accredited on the 1956 estimated tax.

Number 2

You are engaged to audit the Apex Company and its subsidiary, Apex Sales Co., as of December 31, 1955. During the course of the audit you discover the balances of the intercompany accounts do not agree.

The Apex Company manufactures fountain pens which it sells to its subsidiary at cost plus 20%. The subsidiary then sells the fountain pens to jewelry stores.

Following is a copy of part of the intercompany account ledger sheets:

ACCOUNT IN THE APEX COMPANY GENERAL LEDGER

Intercompany Account—Apex Sales Co.

Date	*Reference*	*Amount*	*Date*	*Reference*	*Amount*
	Total forwarded	$178,683.00		Total forwarded	$123,867.00
Dec. 26	SR 17877	1,950.00	Dec. 26	CR	3,567.00
27	SR 17878	1,194.00	29	CR	31,127.00
28	SR 17879	2,183.00	31	Balance	28,189.00
29	SR 17880	849.00			
31	SR 17882	1,891.00			
		$186,750.00			$186,750.00

ACCOUNT IN THE APEX SALES CO. GENERAL LEDGER

Intercompany Account—Apex Company

Date	*Reference*	*Amount*	*Date*	*Reference*	*Amount*
	Total forwarded	$127,434.00		Total forwarded	$176,508.00
Dec. 28	CD	31,127.00	Dec. 26	VR 34333-17876	2,175.00
31	CD	19,777.00	28	VR 34334-17877	1,950.00
31	RG 74	2,329.00	29	VR 34335-17878	1,194.00
31	Balance	6,318.00	31	VR 34336-17881	3,647.00
			31	VR 34340-17883	1,511.00
		$186,985.00			$186,985.00

Discussion with company employees developed the following explanation of references found on the ledger accounts:

SR —Sales register and invoice number.
CR—Cash receipts book.
CD—Cash disbursements book.
VR—Voucher register, receiving report number and Apex Company invoice number.
RG—Returned goods register and debit memo number.

A review of the inventory observation working papers discloses the following information:

Observation at Apex Company on December 31, 1955:

(1) Last shipment prior to the physical inventory was billed on invoice number 17882 dated December 31, 1955.
(2) No returned merchandise was received from the Apex Sales Co. during the month of December 1955.
(3) The last receiving report used in December 1955 was number 59,742 dated December 30, 1955.

Observation at Apex Sales Co. on December 31, 1955:

(1) Last shipment prior to the physical inventory was billed on invoice number 77843 dated December 31, 1955.
(2) The last shipment of merchandise returned to the Apex Company in December 1955 was entered on debit memo number 74 dated December 31, 1955.
(3) The last receiving report used in December 1955 was number 34337 dated December 31, 1955 for merchandise billed on Apex invoice 17879.

You are to prepare in good form:

a. A reconciliation of the intercompany accounts.
b. The journal entries required by each company to:
   (1) Adjust the intercompany accounts.
   (2) Adjust the inventories which are based on physical inventories taken December 31, 1935 and valued by each of the two companies at its cost.

Number 3

A new product of Elise Toiletries, Inc. is Lano-Lov Skin Lotion, to be sold in 4 oz. bottles at a suggested retail price of $1. Cost and production studies show the following cost:

Item No.	*Description*	*Container Cost*	*Comments*
2147	4 oz. bottle	$5.50 per gross	Allow for waste and breakage—2%
315	label	3.30 per 1,000	Allow for waste and breakage—3%

(Product will be reshipped in bottle cases.)

Raw Materials

Item No.	*Description*	*Cost*	*Quantity used per 125 gallon batch*
4247	compound 34A	$40.00 per 100 lbs.	70.0 lbs.
3126	alcohol and glycerin	40.00 per 100 lbs.	76.0 lbs.
4136B	perfume oil*		3.5 lbs.

* Perfume oil is mixed by the company according to its secret formula.
Standard costs of a 90 lb. batch are as follows:

Ingredients	$2,169.95
Direct labor—4.4 hours @ $2.28 per hour	10.03

Manufacturing overhead—$7.50 per batch plus $1.95 per standard labor hour.
(*NOTE: A gallon contains 128 oz.*)

Allowance for Lost Material

Over-filling, waste and breakage—Allow 4% of standard material cost.

Direct Labor per Gross

Compounding	0.12 hours at $1.90
Filling and packing	1.00 hours at $1.60

Manufacturing Overhead

Compounding	$3.00 per standard labor hour
Filling and packing	1.50 per standard labor hour plus .90 per gross

a. You are to prepare a standard cost sheet for one gross bottles of this product, arranging the data under the five subheadings listed above. *Calculations should be made to the nearest cent per gross.*
b. The company expected to produce 1,000 gross of Lano-Lov Lotion in its first week of production, but actually produced only 800 gross. Its direct labor cost of filling and packing was:
Filling and packing, 780 hours—$1,263.60
Prepare an analysis of the labor cost variance from standard showing the causes of the variance.

Number 4

The following information pertains to the operation of the water fund of the city of M. Included in the operations of this fund are those of a special replacement fund for the water department, the accounts of which are a part of the accounts of the water fund.

The balances in the accounts of this fund on January 1, 1955 were as follows:

Cash	$ 6,126
Accounts receivable	7,645
Stores	13,826
Investments of replacement fund	21,700
Permanent property	212,604
Accounts payable	4,324
Customers' deposits	1,500
Replacement fund reserve	21,700
Operating surplus	21,773
Bonds payable	60,000
Capital surplus	152,604

The following items represent the total transactions of the fund for the year ended December 31, 1955.

(1) Services billed	$146,867
(2) Accounts collected	147,842
(3) Uncollectible accounts of prior years written off	1,097
(4) Invoices and payrolls approved for current expense	69,826
(5) Invoices approved for purchase of water department stores	31,424
(6) Stores issued for use in operation	32,615
(7) Supplies secured from general fund stores and used in operation (cash transferred to general fund)	7,197
(8) Vouchers approved for payment of bonds and interest of $3,000	23,000
(9) Depreciation entered as charge against current income and credited to replacement reserve	10,600

(10) Deposits received	400
Deposits refunded	240
(11) Invoices approved for replacements of equipment which cost $6,200	7,800
(12) Invoices approved for additions to plant	12,460
(13) Vouchers approved for purchase of securities necessary to fully invest the replacement fund	compute
(14) Income received on investments	1,102
(15) Warrants drawn for invoices, payrolls and vouchers approved	147,316

From the above information you are to prepare:
a. A balance sheet of the fund as of December 31, 1955.
b. An operating statement of the water department for 1955.
c. An analysis of the operating surplus of the department for 1955.

Number 5

The following are the balance sheets of Parco, Inc. and Subco, Inc. as of December 31, 1953:

	Parco, Inc.	*Subco, Inc.*
Cash	$ 432,576	$ 32,569
Accounts receivable	825,620	225,627
Inventories	1,628,429	625,375
Prepaid expenses	36,475	5,648
Total	$2,923,100	$889,219
Accounts payable	$ 325,647	$437,989
Federal income tax payable	250,000	15,000
Capital stock	300,000	50,000
Retained earnings	2,047,453	386,230
Total	$2,923,100	$889,219

As of December 31, 1953, Parco, Inc. acquired from the stockholders all of the shares of stock of Subco, Inc. in exchange for $550,000 of Parco's 4% ten-year debentures. The excess cost of acquisition (excess of the purchase price over the net assets of Subco) is to be amortized on Parco's books by charges to income over a ten-year period.

For the years 1954 and 1955, operations of Subco, Inc. resulted in *losses* of $52,376 and $15,226, respectively, and operations of Parco, Inc. resulted in *profits* of $387,465 and $420,009, respectively. Parco provided a reserve on its books by charges to income for the losses of its subsidiary. The profits shown above for Parco are *before* provision for amortization of the excess cost of acquisition and for the losses of its subsidiary, Subco. Dividends of $150,000 were paid by Parco in each of the years 1954 and 1955.

The remaining assets and liabilities of Parco and Subco at December 31, 1954 and 1955 were as follows:

Assets	*Parco*		*Subco*	
	1954	*1955*	*1954*	*1955*
Cash	$ 426,879	$ 490,327	$ 30,194	$ 31,187
Accounts receivable	897,426	940,227	200,525	203,287
Inventories	1,826,162	1,952,173	600,476	535,711
Advances to Subco, Inc.	165,000	180,000		
Prepaid expenses	32,879	34,327	5,347	4,621
Liabilities				
Accounts payable	357,428	298,627	287,688	226,178
Federal income taxes payable	406,000	443,500		
Advances from Parco, Inc.			165,000	180,000

From the information shown above prepare a work sheet for use in preparing a consolidated balance sheet as of December 31, 1955. Key and explain all entries made as adjustments or eliminations and prepare supporting schedules for major computations. (*You are to disregard any income tax effects of your entries.*)

FORM **1040**
U. S. Treasury Department
Internal Revenue Service

U. S. INDIVIDUAL INCOME TAX RETURN

For Calendar Year
or other taxable year beginning ....., 1955, and ending ....., 195....
(Please type or print plainly)

1955

NAME (IF THIS IS A JOINT RETURN OF HUSBAND AND WIFE, USE FIRST NAMES OF BOTH)

JOHN C. and MABEL SCOTT

HOME ADDRESS (NUMBER AND STREET OR RURAL ROUTE) | (CITY OR POST OFFICE) | (ZONE) | (COUNTY) | (STATE)

145 Oakview Lane | Pittsburgh | 50 | - | Pennsylvania

YOUR SOCIAL SECURITY NO. AND OCCUPATION	WIFE'S SOCIAL SECURITY NO. AND OCCUPATION
161-18-5023 Controller	158-01-6253 Housewife

If Income Was All From Wages, Use Pages 1 and 2 Only. If Such Income Was Less Than $5,000, You May Need to Use Page 1 Only. See Page 3 of the Instructions.

Exemptions

1. Check blocks which apply. Check for wife if she had no income or her income is included in this return.
   - Regular $600 exemption — ☒ Yourself ☒ Wife
   - 65 or over at end of taxable year — ☐ Yourself ☒ Wife
   - Blind at end of taxable year — ☐ Yourself ☐ Wife

   Enter number of boxes checked → 3
2. List names of your children who qualify as dependents; give address if different from yours. Howard — Enter number of children listed → 1
3. Enter number of exemptions claimed for other persons listed at top of page 2 → 1
4. Enter the total number of exemptions claimed on lines 1, 2, and 3 → 5

Income

5. Enter all wages, salaries, bonuses, commissions, and other compensation received in 1955, before payroll deductions. Outside salesmen and persons claiming traveling, transportation, or reimbursed expenses, see instructions, page 5.

Employer's Name — Where Employed (City and State)	Wages, etc.	Income Tax Withheld
Johnson Mfg. Co. Pittsburgh, Penn. (1)	$ 27,750	$ 7,000
Elaborate Foundry Co., St. Louis, Mo.	7,200	1,800
Excess F.I.C.A.		84
Enter totals here →	$ 34,950	$ 8,884

6. Less: Excludable "Sick Pay" in line 5 (See instructions, page 5. Attach required explanation.) — 300
7. Balance (line 5 less line 6) — $ 34,650
8. Profit (or loss) from business (from separate Schedule C) — 3,000
9. Profit (or loss) from farming (from separate Schedule F) —
10. Other income (or loss) from page 3 — 11,373
11. ADJUSTED GROSS INCOME (sum of lines 7, 8, 9, and 10) — $ 49,023

Special computation

Unmarried or legally separated persons qualifying as "Head of Household," see instructions, page 14, and check here ☐

Widows and widowers who are entitled to the special tax computation, see instructions, page 14, and check here ☐

IF INCOME ON LINE 11 IS UNDER $5,000, AND YOU DO NOT ITEMIZE DEDUCTIONS, USE TAX TABLE ON PAGE 16 OF INSTRUCTIONS. IF INCOME WAS $5,000 OR MORE, OR IF YOU ITEMIZE DEDUCTIONS, COMPUTE YOUR TAX ON PAGE 2.

Tax due or refund

12. Enter tax from the Tax Table, or from line 9, page 2. Please check if you use Tax Table ☐ — $ 14,737

If income was all from wages, omit lines 13 through 16

13. (a) Dividends received credit (line 5 of Schedule J) — $ 116
    (b) Retirement income credit (line 12 of Schedule K) — 120 — 236
14. Balance (line 12 less line 13) — $ 14,501
15. Enter your self-employment tax from separate Schedule C or F —
16. Sum of lines 14 and 15 — $ 14,501
17. (a) Tax withheld (line 5 above). Attach Forms W-2 (Copy B) — $ 8,884
    (b) Payments and credits on 1955 Declaration of Estimated Tax (See instructions, page 13.) — 5,000 — $ 13,884
    District Director's office where paid .....
18. If your tax (line 12 or 16) is larger than your payments (line 17), **enter the balance here** → $ 617
    Send this balance with your return to "Internal Revenue Service." If less than $1.00, do not remit.
19. If your payments (line 17) are larger than your tax (line 12 or 16), **enter the overpayment here** → $
    If less than $1.00, it will be refunded only upon application. See instructions, page 15.

Enter amount of line 19 you want: Credited on 1956 estimated tax $..... ; Refunded $.....

Is your wife (husband) making a separate return for 1955? ☐ Yes ☐ No If "Yes," write her (his) name.

Did you pay or agree to pay anyone for assistance in the preparation of your return? ☐ Yes ☐ No If "Yes," enter his name and address.

Do you owe any Federal tax for prior years? ☐ Yes ☐ No

Taxpayer sign here

I declare under the penalties of perjury that this return (including any accompanying schedules and statements) has been examined by me and to the best of my knowledge and belief is a true, correct, and complete return.

(Your signature) (Date) (If this is a joint return, wife's signature) (Date)

● To assure split-income benefits, husband and wife must include all their income and, even though only one has income, BOTH MUST SIGN.

Preparer (other than taxpayer) sign here

I declare under the penalties of perjury that I prepared this return for the person(s) named herein; and that this return (including any accompanying schedules and statements) is, to the best of my knowledge and belief, a true, correct, and complete return based on all the information relating to the matters required to be reported in this return of which I have any knowledge.

(Individual or Firm Signature) (Address) (Date)

● ATTACH COPY B OF FORMS W-2 HERE ●

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Page 2

EXEMPTIONS FOR PERSONS OTHER THAN YOUR WIFE AND CHILDREN

Name	Relationship	Did dependent live in your home?	Did dependent have gross income of $600 or more?	Amount YOU spent for dependent's support. If 100%, write "All"	Amount spent by OTHERS including dependent from own funds
R. R. Smith	None	Yes	No	$ All	$

Enter on line 3, page 1, the number of exemptions claimed above.
→ If an exemption is based on a multiple-support agreement of a group of persons, attach information described on page 5 of instructions.

ITEMIZED DEDUCTIONS—IF YOU DO NOT USE TAX TABLE OR STANDARD DEDUCTION

If Husband and Wife (Not Legally Separated) File Separate Returns and One Itemizes Deductions, the Other Must Also Itemize

Describe deductions and state to whom paid. If more space is needed, attach additional sheets. Please put your name and address on any attachments.

Contributions	Total Contributions (not to exceed 20 percent of line 11, page 1, except in special cases described on page 11 of instructions)	$ 1,850
Interest	Total	1,200
Taxes	Total	2,000
Medical and dental expense (If 65 or over, see instructions, page 12)	Submit itemized list. Do not enter any expense compensated by insurance or otherwise. 1. Cost of medicines and drugs, in excess of 1 percent of line 11, page 1 $ 2. Other medical and dental expenses 3. Total $ 4. Enter 3 percent of line 11, page 1 5. Allowable amount (excess of line 3 over line 4). (See instructions, page 12, for limitations.)	
Child care	Expenses for care of children and certain other dependents not to exceed $600 (See page 13 of instructions and attach statement)	
Losses from fire, storm, or other casualty, or theft	Auto stolen: Fair market value (less than cost) $2,500 Insurance recovery 2,300 Total losses (not compensated by insurance or otherwise)	200
Miscellaneous	Total	
	TOTAL DEDUCTIONS (Enter on line 2 of Tax Computation, below)	$ 5,250

TAX COMPUTATION—IF YOU DO NOT USE THE TAX TABLE

1. Enter Adjusted Gross Income from line 11, page 1		$49,023
2. If deductions are itemized above, enter total of such deductions. If deductions are not itemized *and line 1, above, is $5,000 or more:* (a) married persons filing separately enter $500; (b) all others enter 10 percent of line 1, but not more than $1,000		5,250
3. Balance (line 1 less line 2)		$43,773
4. Multiply $600 by total number of exemptions claimed on line 4, page 1		3,000
5. TAXABLE INCOME (line 3 less line 4)		$40,773
6. Tax on amount on line 5. Use appropriate Tax Rate Schedule on page 14 of instructions		$14,953 (5)
7. If you had capital gains and the alternative tax applies, enter the tax from separate Schedule D		$14,787
8. Tax credits. If you itemized deductions, enter: (a) Credit for income tax payments to a foreign country or U. S. possession (Attach Form 1116) $ 50		
(b) Income tax paid at source on tax-free covenant bond interest and credit for partially tax-exempt interest		$ 50
9. Enter here and on line 12, page 1, the amount shown on line 6 or 7 less amount claimed on line 8		$14,737

IF INCOME WAS ALL FROM SALARIES AND WAGES, TEAR OFF THIS PAGE AND FILE ONLY PAGES 1 AND 2. Page 3

Schedule A.—INCOME FROM DIVIDENDS

1. Name of qualifying corporation declaring dividend (See instructions, page 6, for definition of qualifying corporation):	Amount	
	$	
2. Total	$ 3,000	
3. Exclusion of $50 (If both husband and wife received dividends, each is entitled to exclude not more than $50 of his (her) dividends)	100	
4. Enter excess, if any, of line 2 over line 3	$ 2,900	
5. Name of nonqualifying corporation declaring dividend:		
6. Enter total of lines 4 and 5		$ 2,900

Schedule B.—INCOME FROM INTEREST

Name of payer	Amount	Name of payer	Amount	
A. B. Corp.	$ 400		$	
C. D. Corp.	180			
Penn. R. R.	270	Enter total here→		850

Schedule D Summary.—GAINS AND LOSSES FROM SALES OR EXCHANGES OF PROPERTY

1. From sale or exchange of capital assets (from separate Schedule D)	6,447
2. From sale or exchange of property other than capital assets (from separate Schedule D)	150 *

Schedule E.—INCOME FROM PENSIONS OR ANNUITIES (See instructions, page 8)

Part I.—General Rule

1. Investment in contract	$	4. Amount received this year	$	
2. Expected return	$	5. Amount excludable (line 4 multiplied by line 3)		
3. Percentage of income to be excluded (line 1 divided by line 2)	%	6. Taxable portion (excess, if any, of line 4 over line 5)		

Part II.—Where your cost will be recovered within three years and your employer has contributed part of the cost

1. Cost of annuity (amounts paid in)	$	4. Amount received this year	$	
2. Cost received tax-free in past years				
3. Remainder of cost (line 1 less line 2)	$	5. Taxable portion (excess, if any, of line 4 over line 3)		

Schedule G.—INCOME FROM RENTS AND ROYALTIES

1. Kind and location of property	2. Amount of rent or royalty	3. Depreciation (explain in Sch. I) or depletion	4. Repairs (attach itemized list)	5. Other expenses (attach itemized list)	
	$	$	$	$	
Pittsburgh property	1,250	214	150	200	
1. Totals	$	$	$	$	
2. Net profit (or loss) (column 2 less sum of columns 3, 4, and 5)					686

Schedule H.—INCOME FROM PARTNERSHIPS, ESTATES, TRUSTS, AND OTHER SOURCES

1. Partnership (Name and address)	
2. Estate or trust (Name and address)	
3. Other sources (state nature) Foreign $500, Gambling $115, Honorarium $25	640
Total income (or loss) from above sources (Enter here and on line 10, page 1)	$ 11,373

Schedule I.—EXPLANATION OF DEDUCTION FOR DEPRECIATION CLAIMED IN SCHEDULE G

1. Kind of property (If buildings, state material of which constructed). Exclude land and other nondepreciable property	2. Date acquired	3. Cost or other basis	4. Depreciation allowed (or allowable) in prior years	5. Method of computing depreciation	6. Rate (%) or life (years)	7. Depreciation for this year
Pittsburgh property	3/1/35	$ 36,000	$			$ 214 (4)

apc—10—71000 1

Page 4

IF INCOME WAS ALL FROM SALARIES AND WAGES, TEAR OFF THIS PAGE AND FILE ONLY PAGES 1 AND 2.

Schedule J.—DIVIDENDS RECEIVED CREDIT
(See instructions, page 15)

1. Amount of dividends on line 4, Schedule A	$ 2,900
2. Tentative credit (4 percent of line 1)	$ 116
LIMITATIONS ON CREDIT	
3. Tax shown on line 12, page 1, plus amount, if any, shown on line 8(b), page 2	$ 14,737
4. 4 percent of taxable income	$ 1,373
Taxable Income Means (a) If tax is computed on page 2, the amount shown on line 5, page 2. (b) If capital gains alternative tax applies, the amount shown on line 18, separate Schedule D. $34,326 (c) If Tax Table is used, the amount shown on line 11, page 1, less 10 percent thereof, and less the deduction for exemptions ($600 multiplied by the number of exemptions claimed on line 4, page 1).	
5. Dividends received credit. Enter here and on line 13(a), page 1, the smallest of the amounts on lines 2, 3, or 4, above	$ 116

Schedule K.—RETIREMENT INCOME CREDIT (See instructions, page 15)

This credit does not apply:
1. If you received Social Security or Railroad Retirement pensions or annuities of $1,200 or more, OR
2. If you are under 75 years of age and had "earned income" of $2,100 or more.

If separate return, use column B only. If joint return, use column A for wife and column B for husband ⟶	A	B
Did you receive earned income in excess of $600 in each of any 10 calendar years before the taxable year 1955? Widow or widowers see instructions, page 15	☒ Yes ☐ No	☐ Yes ☐ No
If answer above is "Yes" in either column, furnish all information below in that column.		
1. Retirement income for taxable year which is included in line 11, page 1, of this return:		
(a) **For taxpayers under 65 years of age:** Enter only income received from pensions and annuities under public retirement systems, including pensions, annuities, and retirement pay from Armed Forces	$	$
(b) **For taxpayers 65 years of age and older:** Enter total of pensions and annuities, retirement pay from Armed Forces, interest, rents, and dividends	$ 1,450	$
LIMITATION ON RETIREMENT INCOME		
2. Maximum amount of retirement income for credit computation	$ 1,200 00	$ 1,200 00
3. Deduct:		
(a) Amounts received in taxable year as pensions or annuities under the Social Security Act, the Railroad Retirement Acts, and certain other exclusions from gross income	$ 600	$
(b) Compensation in excess of $900 received in the taxable year 1955 for personal services (This line does not apply to persons 75 years of age or over)	-	
4. Total of lines 3(a) and 3(b)	$ 600	$
5. Balance (line 2 minus line 4)	$ 600	$
6. Line 5 or line 1, whichever is lesser	$ 600	$
7. Tentative credit (20 percent of line 6)	$ 120	$
8. Total tentative credit on this return (total of amounts on line 7, columns A and B)	$ 120.	
LIMITATION ON RETIREMENT INCOME CREDIT		
9. Amount of tax shown on line 12, page 1	$ 14,737	
10. Less: Dividends received credit from line 5, Schedule J, above	116	
11. Balance (line 9 less line 10)	$ 14,621	
12. Retirement income credit. Enter here and on line 13(b), page 1, the amount on line 8 or line 11, whichever is smaller	$ 120	

U. S. GOVERNMENT PRINTING OFFICE 1956—16—71900-1

SCHEDULE D (Form 1040)

U. S. Treasury Department—Internal Revenue Service

GAINS AND LOSSES FROM SALES OR EXCHANGES OF PROPERTY

Attach this schedule to your Income Tax Return, Form 1040

1955

For Calendar Year 1955, or other taxable year beginning , 1955, and ending 19

Name and Address

JOHN C. and MABEL SCOTT

(I) CAPITAL ASSETS

Short-Term Capital Gains and Losses—Assets Held Not More Than 6 Months

a. Kind of property (if necessary, attach statement of descriptive details not shown below)	b. Date acquired (mo., day, yr.)	c. Date sold (mo., day, yr.)	d. Gross sales price (contract price)	e. Depreciation allowed (or allowable) since acquisition or March 1, 1913 (attach schedule)	f. Cost or other basis and cost of subsequent improvements (if not purchased, attach explanation)	g. Expense of sale	h. Gain or loss (column d plus column e less sum of columns f and g)
1 ZZ Co. (Worthless)	7/2/55	12/31	-	$ -	$ 500	$ -	$ 500 *
Loan, non-business, worthless	12/8/54	9/1/55	-	-	1,000		1,000 *
2. Enter your share of net short-term gain (or loss) from partnerships and fiduciaries							
3. Enter unused capital loss carryover from 5 preceding taxable years (Attach statement)							
4. Net short-term gain (or loss) from lines 1, 2, and 3							$ 1,500 *

Long-Term Capital Gains and Losses—Assets Held More Than 6 Months

5. Schedule attached		$	$	$	$	$ 14,394
6. Enter the full amount of your share of net long-term gain (or loss) from partnerships and fiduciaries						
7. Net long-term gain (or loss) from lines 5 and 6						$ 14,394

Gain or Loss To Be Taken Into Account	a. Gain	b. Loss
8. Enter net short-term gain (or loss) from line 4	$ -	$ 1,500
9. Enter net long-term gain (or loss) from line 7	$ 14,394	$ -
Use lines 10 through 13 only if gains exceed losses in lines 8 and 9.		
10. Enter short-term gain (line 8, col. a) reduced by any long-term loss (line 9, col. b)	$ -	
11. Enter long-term gain (line 9, col. a) reduced by any short-term loss (line 8, col. b)	$ 12,894	
12. Enter 50 percent of line 11	$ 6,447	
13. Enter here and on line 1, Schedule D Summary, Form 1040, the sum of lines 10 and 12	$ 6,447	
Use lines 14 and 15 only if losses exceed gains in lines 8 and 9.		
14. Enter the excess of losses over gains on lines 8 and 9		$
15. Enter here and on line 1, Schedule D Summary, Form 1040, the **smallest** of the following: (a) the amount on line 14; (b) taxable income computed without regard to capital gains and losses and the deduction for exemptions; or (c) $1,000		$

COMPUTATION OF ALTERNATIVE TAX

(See instructions on other side as to when the alternative tax applies)

16. Enter the income from line 5, page 2, of Form 1040	$ 40,773
17. Enter amount from line 12, column a, above	6,447
18. Balance (line 16 less line 17)	$ 34,326
19. Enter tax on amount on line 18 (Use applicable Tax Rate Schedule on page 14 of Form 1040 Instructions) (6)	$ 11,563
20. Enter 50 percent of line 17	$ 3,224
21. Alternative tax (line 19 plus line 20). If smaller than amount on line 6, page 2, Form 1040, enter this alternative tax on line 7, page 2, Form 1040	$ 14,787

(II) PROPERTY OTHER THAN CAPITAL ASSETS

a. Kind of property (if necessary, attach statement of descriptive details not shown below)	b. Date acquired (mo., day, yr.)	c. Date sold (mo., day, yr.)	d. Gross sales price (contract price)	e. Depreciation allowed (or allowable) since acquisition or March 1, 1913 (attach schedule)	f. Cost or other basis and cost of subsequent improvements (if not purchased, attach explanation)	g. Expense of sale	h. Gain or loss (column d plus column e less sum of columns f and g)
1. Equipment	5/11/55	10/15/55	300	$ 50	$ 500	$ -	$ 150 *
2. Enter your share of gain (or loss) from partnerships and fiduciaries							
3. Net gain (or loss) from lines 1 and 2. Enter here and on line 2, Schedule D Summary, Form 1040							$ 150 *

16—71794-1

JOHN C. AND MABEL SCOTT

STATEMENT ATTACHED TO AND MADE PART OF U.S. INDIVIDUAL INCOME TAX RETURN (FORM 1040) CALENDAR YEAR 1955

SCHEDULE D—LONG TERM CAPITAL GAINS AND LOSSES

Kind of Property	*Date Acquired*	*Date Sold*	*Gross Sales Price*	*Depreciation*	*Cost*	*Expense*	*Gain or Loss**
Residence	1/ 5/45	2/20/55	$28,000	$ —	$25,000	$ —	$ 3,000
Less—Portion of gain re-invested							2,000
Balance							$ 1,000
Pittsburgh property—							
Land	3/ 1/35	3/ 1/55	18,000	—	15,000	—	3,000
Building	3/ 1/35	3/ 1/55	13,560	25,714 (3)	36,000 (3)	—	3,274
FF Com. stock	2/ 5/51	6/11/55	10,000	—	4,000	90	5,910
HH Pfd. stock	3/ 1/54	12/ 1/55	5,000	—	4,000	50	950
GG Com. stock	10/11/51	8/31/55	1,100	—	800	40	260
Total							$14,394

Part 1—Problem 2

(a) Reconciliation of inter-company accounts:

Apex Company—due from Apex Sales Co.

	Dr.	*Cr.*
Balance per ledger	$28,189.00	
SR 17881 (Shipment not recorded)	3,647.00	
Cash in transit		$19,777.00
Returned goods in transit (inventory)		2,329.00
Adjusted balance—December 31, 1955		9,730.00
	$31,836.00	$31,836.00

Apex Sales Co.—due to Apex Company

	Dr.	*Cr.*
Balance per ledger		$ 6,318.00
VR 34337-17879 (Goods received but not recorded)		2,183.00
Shipments in transit (17880 and 17882)		2,740.00
VR 34340-17882 (January shipment recorded in error)	$ 1,511.00	
Adjusted balance—December 31, 1955	9,730.00	
	$11,241.00	$11,241.00

(b-1)

Apex Company—Adjusting journal entries

Apex Sales Co.	$ 3,647.00	
Sales		$ 3,647.00
To record SR 17881		
Cash in transit	$19,777.00	
Apex Sales Co.		$19,777.00
To record payment forwarded from Apex Sales Co. 12-31-55		
Returned sales	$ 2,329.00	
Apex Sales Co.		$ 2,329.00
To record returned goods in transit 12-31-55		

Apex Sales Co.—Adjusting journal entries

Purchases	$ 2,183.00	
Apex Company		$ 2,183.00
To record VR 34337-17879 received but not recorded		

Purchases	$ 2,740.00	
Apex Company		$ 2,740.00
To record Apex Company shipment in transit invoice Nos. 17880 and 17882		
Apex Company	$ 1,511.00	
Purchases		$ 1,511.00
To reverse December entry for goods shipped and received January, 1956		

(b-2)

Apex Company—Inventory adjustment

Inventory	$ 1,941.00	
Cost of goods sold		$ 1,941.00
To record inventory of goods in transit at December 31, 1955 $2,329.00÷1.2 =$1,941.00		

Apex Sales Company—Inventory adjustment

Inventory	$ 2,740.00	
Cost of goods sold		$ 2,740.00
To record goods in transit to Apex Sales Co. at December 31, 1955 on invoices 17880 and 17882.		

Part 1—Problem 3

ELISE TOILETRIES, INC.
LANO-LOV SKIN LOTION
STANDARD COST OF PRODUCING ONE GROSS

(a)

			Total Cost
Container Cost			
4 oz. bottle		$ 5.50	
Allowance for waste and breakage @ 2%		.11	
Labels $\frac{144}{1000}\times\$3.30$		.48	
Allowance for waste and breakage		.01	
Total container cost			$ 6.10
Raw Materials (Compounded in 125 gal. batches)			
Compound 34A 70/100×$40.00		$ 28.00	
Alcohol and glycerine 76/100×$40.00		30.40	
Perfume oil (compounded in 90 lb. batches)			
Ingredients	$2,169.95		
Direct labor	10.03		
Manufacturing overhead $7.50+1.95×4.4	16.08		
Total cost for 90 lbs.	$2,196.06		
Cost per Lano-Lov batch 3.5/90×$2,196.06		85.40	
Cost per 125 gal. batch		$143.80	
Cost per gross 4.5/125×$143.80			5.18
Allowance for Lost Material—4%×5.18			.21
Direct Labor per Gross			
Compounding 0.12 @ $1.90		$ .23	
Filling and packing 1.00 hr. @ $1.60		1.60	1.83
Manufacturing Overhead			
Compounding 0.12 @ $3.00		$ .36	
Filling and packing 1.00 @ $1.50+$.90		2.40	2.76
Total Standard Cost—One Gross, Lano-Lov			$16.08

ELISE TOILETRIES, INC.

LANO-LOV SKIN LOTION—ANALYSIS OF LABOR COST VARIANCE
FILLING AND PACKING FIRST WEEK'S PRODUCTION

(b)		
Standard direct labor hours for 800 gross production	800	
Actual direct labor hours	780	
Actual hours under direct hours	20	
Standard labor rate	$ 1.60	
Variance due to time (favorable)		$32.00
Actual direct labor rate	$ 1.62	
Standard direct labor rate	$ 1.60	
Actual rate over standard rate	$ .02	
Actual labor hours	7.80	
Variance due to labor rate (unfavorable)		15.60
Net variance, standard over actual		$16.40

Solution—Problem 4

CITY M—WATER DEPARTMENT
WORKING PAPERS
JANUARY 1, 1955–DECEMBER 31, 1955

	Trial Balance January 1, 1955		*1955 Transactions*				*Income and Expense*		*Balance Sheet*	
	Dr.	*Cr.*		*Dr.*		*Cr.*	*Dr.*	*Cr.*	*Assets*	*Liabilities*
Cash	$ 6,126		(14)	$ 1,102	(7)	$ 7,197		$	717	
			(2)	147,842	(11)	147,316				
			(10)	160						
Accounts receivable	7,645		(1)	146,867	(2)	147,842			5,573	
					(3)	1,097				
Stores	13,826		(5)	31,424	(6)	32,615			12,635	
Investments of replacement fund	21,700		(13)	2,800					24,500	
Permanent property	212,604		(12)	12,460						
			(11)	1,600					226,664	
Accounts payable		$ 4,324	(15)	147,316	(15)	2,800				$ 4,318
					(12)	12,460				
					(8)	23,000				
					(4)	69,826				
					(11)	7,800				
					(5)	31,424				
Customers' deposits		1,500			(10)	160				1,660
Replacement fund reserve		21,700	(11)	7,800	(9)	10,600				24,500
Operating surplus		21,773								21,773
Bonds payable		60,000	(8)	20,000						40,000
Capital surplus		152,604			(12)	12,460				186,664
					(11)	1,600				
					(8)	20,000				
	$261,901	$261,901								
Services					(1)	146,867		$146,867		
Bad Debts			(3)	1,097			$ 1,097			
Operating expenses			(4)	69,826			109,638			
			(6)	32,615						
			(7)	7,197						
Retirement of bonds and interest			(8)	23,000			23,000			
Depreciation			(9)	10,600			10,600			
Expended for plant additions			(12)	12,460			12,460			
Interest income					(14)	1,102		1,102		
				$676,166		$676,166				
							$156,795	$147,969		
Net decrease in current surplus								8,826	8,826	
							$156,795	$156,795		
									$278,915	$278,915

Solution—Problem 4—Continued

CITY OF M
WATER DEPARTMENT
BALANCE SHEET—DECEMBER 31, 1955

(a)

Assets			*Liabilities and Capital*		
Cash	$ 717		Accounts payable	$ 4,318	
Accounts receivable	5,573		Customers' deposits	1,660	
Stores	12,635	$ 18,925	Operating surplus	12,947	$ 18,925
Permanent property	$226,664		Bonds payable	$ 40,000	
Investments of replacement fund	24,500		Replacement fund reserve	24,500	
		251,164	Capital surplus	186,664	251,164
		$270,089			$270,089

CITY OF M
WATER DEPARTMENT
STATEMENT OF INCOME AND EXPENSE—YEAR ENDED DECEMBER 31, 1955

(b and c)

Income from service to customers		$146,867
Operating expenses:		
Payrolls and other operating expenses	$ 69,826	
Stores and supplies used	39,812	
Depreciation	10,600	120,238
Net operating income		$ 26,629
Other income and expense:		
Interest on bonds	$ 3,000	
Accounts of prior year written off	1,097	
	$ 4,097	
Interest on investments	1,102	2,995
Net income		$ 23,634
Capital outlays		
Retirement of bonds	$ 20,000	
Expended for plant additions	12,460	32,460
Net charge to operating surplus		$ 8,826
Operating surplus—Jan. 1, 1955		21,773
Operating surplus—Dec. 31, 1955		$ 12,947

Part 1—Problem 5

PARCO, INC.
CONSOLIDATING WORK SHEET
DECEMBER 31, 1955

	Parco Inc.	*Subco Inc.*	*Adjustment*		*Eliminations*	*Consolidated*
Assets						
Cash	$ 490,327	$ 31,187				$ 521,514
Accounts receivable	940,227	203,287				1,143,514
Inventories	1,952,173	535,711				2,487,884
Advances to Subco, Inc.	180,000				(1) $180,000	
Prepaid expenses	34,327	4,621				38,948
Investment in Subco, Inc.	550,000		(a) $22,754		(2) 436,230	91,016
Reserve for loss, Subco, Inc.	(67,602)				(2) (67,602)	
	$4,079,452	$774,806			$548,628	$4,282,876
Liabilities						
Accounts payable	$ 298,627	$226,178				$ 524,805
Federal income taxes	443,500					443,500
Advances from Parco, Inc.		180,000			(1) $180,000	
4% Debentures due Dec. 31, 1963	550,000					550,000
Capital Stock:						
Parco, Inc.	300,000					300,000
Subco, Inc.		50,000			(2) 50,000	
Retained earnings						
Parco, Inc.	2,487,325		(a) $22,754			2,464,571
Subco, Inc.		318,628			(2) 318,628	
	$4,079,452	$774,806	$22,754	$22,754	$548,628	$4,282,876

Explanations

(a) To amortize excess of cost over book value of investment in Subco, Inc. at 10% per annum.
(1) To eliminate inter-company advance.
(2) To eliminate investment in Subco, Inc., the related reserve, the capital stock and retained earnings of Subco, Inc. and to carry forward the unamortized investment cost which was in excess of book value acquired.

Part 1—Problem 5—Continued

RETAINED EARNINGS (PER BOOKS, BEFORE ADJUSTMENT)

	1954	1955
Parco, Inc.		
Beginning balance	$2,047,453	$2,232,542
Income for year	387,465	420,009
Total	$2,434,918	$2,652,551
Dividends paid	150,000	150,000
Reserve for Subco, Inc. loss	52,376	15,226
Ending balance	$2,232,542	$2,487,325
Subco, Inc.		
Beginning balance	$ 386,230	$ 333,854
Loss for year	52,376	15,226
Ending balance	$ 333,854	$ 318,628

Excess of cost over book value of stock of Subco, Inc.		
Cost	$ 550,000	
Book value:		
Capital stock	$ 50,000	
Retained earnings	386,230	436,230
Excess at requisition	$ 113,770	
Amortization of excess		
1954	11,377	
1955	11,377	
Balance, December 31, 1955	$ 91,016	

AUDITING

R. K. MAUTZ

THE Auditing section of the May, 1956 C.P.A. Examination was given on Thursday, May 10, in a three and one-half hour session from 9 A.M. to 12:30 P.M.; it included 7 questions, all of which were to be solved by the candidate. The total weight assigned to this section of the examination was 100 points, and the instructions point out that the suggested time allowances for each problem are approximately equal to their point values. The questions were prepared by the Board of Examiners of the American Institute of Accountants. A grade of 75 is passing.

Number 1 (Estimated time—10 to 16 minutes)

In making an examination of a company engaged in wholesaling goods you find that a very substantial part of the inventory of merchandise is on consignment to customers in other cities and at independent warehouses in other cities. State the procedures you would follow in your verification of the inventory on consignment and in warehouses.

Number 2 (Estimated time—22 to 32 minutes)

You are making an annual examination for the purpose of rendering an opinion regarding financial statements for use in an annual report to stockholders. Answer the following questions *concerning events subsequent to the date of the financial statements:*

a. What auditing procedures should normally be followed in order to obtain knowledge of subsequent happenings?
b. What is the period with which the auditor is normally concerned with regard to post-balance sheet events?
c. Give five different examples of events or transactions which might occur in the subsequent period.
d. What is the auditor's general responsibility, if any, for reporting such events or transactions?
e. In your report, how would you deal with each of the examples you listed in *Part C*?

Number 3 (Estimated time—18 to 25 minutes)

Weston & Brown, a partnership, are fee owners of valuable coal reserves and leased the property to Premur Coal Corporation on January 1, 1954 for a term of five years. The lease agreement provided for a royalty of $.25 a ton to be paid to Weston & Brown for each ton of coal *mined and sold*, based on railroad weight at the nearest railroad scales. The agreement further provided that the partnership had the right to examine the books and records of the corporation pertaining to such royalties. The coal was to be removed by the strip-mine, or open-pit, method and this mining operation, using union labor, was to be the only coal-mining operation engaged in by the Premur Corporation during the life of such lease.

Each month since the beginning of the lease the Premur Coal Corporation has forwarded to the partnership a statement of the tons mined and sold and their check for the coal royalities in the indicated amount.

Weston & Brown believe that the tonnage being mined and sold greatly exceeds the amounts being reported to them.

The partnership has never previously engaged professional accountants. On July 1, 1955 you are engaged by Weston & Brown to ascertain whether the partner-

ship is receiving the proper royalties due under the lease.

a. Outline the preliminary steps you would take before going to the Premur office.
b. Outline the audit procedures you would follow in completing the engagement.

Number 4 (Estimated time—22 to 32 minutes)

A surprise count of the Y Company's imprest petty cash fund, carried on the books at $5,000 was made on November 10, 1955.

The Company acts as agent for an Express Company in the issuance and sale of money orders. Blank money orders are held by the cashier for issuance upon payments of the designated amounts by employees. Settlement with the Express Company is made weekly with its representative who calls at the Y Company office. At that time he collects for orders issued, accounts for unissued orders, and leaves additional blank money orders serially numbered.

The count of the items presented by the cashier as composing the fund were as follows:

Currency (bills and coin)		$2,200
Cashed checks		500
Vouchers (made out in pencil and signed by recipient)		740
N.S.F. checks (dated June 10 and 15, 1955)		260
Copy of petty cash receipt vouchers:		
Return of expense advance	$200	
Sale of money orders (#C1015–1021)	100	300
Blank money orders—claimed to have been purchased for $100 each from the Express Company (#C1022 to 1027)		600

At the time of the count there was also on hand the following:

Unissued money orders #C1028–1037.

Unclaimed wage envelopes (sealed and amounts not shown).

The following day the custodian of the fund produced vouchers aggregating $400 and explained that these vouchers had been temporarily misplaced the previous day. They were for wage advances to employees.

a. Show the proper composition of the fund at November 10, 1955.
b. State the audit procedures necessary for the verification of the items in the fund.

Number 5 (Estimated time—20 to 28 minutes)

a. You have been engaged for the first time to make an audit of the accounts of the Western Company which has been in business for ten years. Outline an audit program for the examination of the company's income tax position.
b. You are making your first audit of the accounts of the Southern Co. for the year 1955. For 1955 the income was approximately $800,000 before taxes, and Retained earnings December 31, 1955 amounted to $110,000. The company has filed a Federal income tax return for 1955 indicating a total tax of $400,000. In addition, you find that the Internal Revenue Service has disallowed part of the depreciation deductions claimed in 1952 and 1953 on certain fixed assets. The additional income tax liability resulting from the disallowances in 1952 and 1953 amounts to $50,000. The depreciation claimed in returns filed for 1952 through 1955 was on a consistent basis. Upon examination of the years 1954 and 1955, the anticipated disallowances will result in a further additional income tax liability for each year of $20,000. Your examination disclosed no questionable items other than depreciation deductions.

Give the balance sheet presentation of the Federal income taxes payable in the following situations:

(1) The company has agreed to the disallowances and has accepted, but not paid, the Internal Revenue Service's assessment of $50,000.
(2) The company has been advised by its counsel that the disallowances are improper and has notified the Internal Revenue Service that the disallowances will be contested.

Number 6 (Estimated time—30 to 40 minutes)

The loan agreement of the X Manufacturing Co. provides that a *general audit of the accounts* be made annually and that a copy of the auditor's long-form report be sent to the bank making the loan.

For each of the balance sheet classifications listed below, state the information which you believe should ordinarily be included in the report, either in the financial statements or in the accompanying comments:

Accounts receivable
Inventories
Investments
Property and equipment
Current liabilities
Long-term debt
Capital stock and surplus

Number 7 (Estimated time—28 to 37 minutes)

The XYZ National Bank trust department operates a *Common Trust Fund* for the purpose of pooling money and diversifying the investments of certain small trust funds for which the bank is the trustee. You have been engaged to audit the accounts of the "Common Trust Fund" as of December 31, 1955 for the purpose of (a) determining the net book value at that date and (b) the amount of income and capital gain or loss for the period then ended. You have previously audited the "Fund" for the year ended December 31, 1954.

Securities of the "Common Trust Fund" are held in a separate file in the bank safe-deposit vault. The trust department directors authorize all purchases and sales of securities. A separate bank account and ledger is maintained for the "Common Trust Fund"; however, transactions, which are relatively few, are handled through normal channels of the trust department.

You are to prepare an audit program for the examination of the Common Trust Fund. The only assets of the fund are cash, securities, and accrued income receivable. There are some liabilities for accrued expenses.

Answer to Question Number 1

1. Obtain a list of descriptions, quantities, amounts, and location of all inventory on consigment or in public warehouses.

2. Reconcile total of this list with inventory account balances, taking into consideration inventory quantities not on consignment or in warehouses.

3. Ascertain the company's practice with respect to pricing merchandise shipped on consignment and to warehouses. If any mark-up over cost is included in the inventory price, such mark-up should be eliminated for statement purposes. Ordinary costs of shipping and handling, providing they are not duplicates of costs already included, should be included in the inventory price.

4. Confirm by direct correspondence with the holders, all inventory quantities on consignment or in public warehouses as of the inventory verification date. If possible, company employees should be requested to assist in preparation of confirmation requests, but mailing and receipt of replies should be under the control of the accountant. Because of the time involved in obtaining replies, confirmation requests should be mailed as early in the work as possible.

5. Because the operation of a public

warehouse is not such as to give substantial assurance of the accuracy and validity of confirmed amounts, arrangements should be made to visit any locations at which major amounts of inventory are stored in order to examine the inventory and make test counts. Any such counts should be traced into the company's inventory summary.

6. For any substantial amounts not examined physically, shipping documents should be examined to assure that the goods were shipped; terms of the shipment should be investigated and the propriety of the entry reviewed.

7. Warehouse receipts for amounts stored in public warehouses should be examined as should correspondence with consignees and recent copies of account sales received from consignees. Be alert to the possibility of stored or consigned goods serving as security for loans or other obligations, and the possibility of merchandise on consignment proving unsalable.

8. Review confirmations from consignees and warehouses and tie in with company's shipping records, giving special attention to the inventory cut-off as of the inventory verification date so that no shipments are counted more than once or omitted from inclusion in the inventory total.

9. Standard inventory verification practices with respect to footings, extensions and summaries, tests of pricing, and existence of obsolete and slow-moving or damaged merchandise should be made.

10. An inventory representation covering the merchandise on consignment and in warehouses should be obtained from appropriate company officials.

Answer to Question Number 2

a. The following auditing procedures should be followed in order to obtain knowledge of events subsequent to the date of the financial statements.

1. Read the minutes of any meetings of stockholders, of the board of directors, or of any important committees of the board of directors with a view toward discovering any matters pertinent to the operations or financial condition of the company.

2. Obtain and study copies of any interim financial statements prepared by the company for periods subsequent to the balance sheet date.

3. Inquire of company officers and key employees as to the occurrence of any important events or transactions subsequent to the balance sheet date.

4. In addition, certain procedures considered to be a part of the normal audit work also are effective in disclosing events occurring subsequent to the balance sheet date. For example, the review of bank statements obtained after the balance sheet date, the search for unrecorded liabilities, review of the collectibility of receivables, and investigation of pending litigation by correspondence with attorneys may uncover subsequent events. Throughout the examination, the auditor should be alert to indications of events or transactions occurring after the balance sheet date but of importance to readers of the statements.

b. The period with which the auditor is normally concerned with regard to post-balance sheet events extends from the date of the balance sheet through the last day of active work on the examination, which generally is the last date he works at the client's place of business. This is also commonly used as the date of the audit report. Of course, if some event should come to his attention after he has completed his field work but before the report is issued, he has a responsibility to give it adequate consideration also.

c. Examples of post-balance sheet events are.

1. A fire, flood, or other physical act effecting substantial destruction.
2. The bankruptcy of an important

debtor whose account was considered collectible at the balance sheet date.

3. The conclusion of litigation establishing a material obligation.
4. The conclusion of negotiations with respect to establishment of a profit-sharing or pension agreement.
5. A major strike or other work-stoppage closing down a substantial portion of the company's facilities.

d. The auditor's responsibility for reporting such events or transactions in the financial statements is secondary to that of the company. He should (1) make a reasonable effort to discover their existence (see part (a) of this solution); (2) require adequate disclosure in the financial statements or notes attached thereto of any such events or transactions that have a material bearing on the results of operations or financial condition of the company reported on; (3) include an exception in his opinion if disclosure which in his own judgment is required is rejected by the client.

e. The examples listed in part (c) should be dealt with as follows in the auditor's report:

1. Explain nature and extent of loss, including effect on client's operations and productive capacity, in a note to the financial statements.

2. If the allowance for uncollectibles is insufficient to cover this item and other reasonably anticipated losses, an additional provision should be made. It is common practice to consider post-balance sheet events such as this in determining the necessary provision for uncollectible accounts. It would be less common but might be desirable to explain in a footnote the loss of a major customer which might be the case if the receivable in question arose from sales.

3. Unless the litigation is unrelated to the activities of prior periods, which seems unlikely, the loss should be recognized as a charge to income or retained earnings in the year under examination. This would require including the liability in the balance sheet as well.

4. Footnote disclosure of the establishment of the profit-sharing or pension plan together with its anticipated impact on the company's operations and financial condition should be made.

5. Footnote disclosure should be made of the existence of the work stoppage including some description of its extent and importance. There is little difference between the financial effects of a strike and a so-called "act of God," such as a fire or flood, insofar as readers of financial statements are concerned.

Answer to Question Number 3

a. Preliminary steps before going to the Premur office:

1. Obtain a copy of the lease agreement and study its terms and requirements. Give particular attention to the apparent intent of the lease with respect to the meaning of the expression "mined and sold," and determine whether the terms with respect to examination of books and records are such as to make available to you all records necessary for a satisfactory examination of the royalty payments. Request clarification from Weston & Brown's counsel of any passages which are not clear.

2. Obtain copies of the monthly statements of tons mined and sold supporting the royalty payments since the beginning of the lease and review for arithmetical accuracy or other irregularities, inconsistencies, and any unexplained fluctuations in volume of coal mined and sold. Prepare a schedule of payments received for comparison with Premur's records.

3. Obtain from Premur Coal Corporation, if possible, a copy of their contract with the labor union. Certain "fringe benefits" to members of the union are contingent on volume mined and the union contract may include provision for

the determination and verification of tons mined.

4. Make arrangements through Weston & Brown for permission to obtain necessary records and working facilities at the Premur office and obtain a letter of introduction.

b. Audit procedures to be followed in completing the engagement:

1. Review the accounting and operating procedures of Premur Coal Corporation with respect to the mining and sale of coal. Investigate especially the possibility of shipments by truck, sales to employees, local sales not requiring rail shipment, and the like. Bear in mind that inadequate royalty payments may arise through improper activities of employees of the Premur Coal Corporation as well as deliberate understatements by its management.

2. Request for examination production, sales, shipping, and inventory records. Examine these from the standpoint of determining tons mined and sold each month and compare amounts thus determined with amounts shown in the statements received by Weston & Brown.

3. Examine production records kept by operating crews as well as formal office reports and watch for inconsistencies.

4. Examine available shipping documents for shipments not included in royalty statements, and reconcile shipments per records with recorded sales for a test period.

5. Examine sales records for possibility of sales omitted from royalty statements; reconcile sales account balance with royalties paid.

6. Determine benefit payments to labor union and reconcile tonnage used as basis for such payments with tonnage on which royalties are paid.

7. Physically inspect inventories of mined but unsold coal and obtain statements from appropriate company personnel as to quantities on hand. Compare with inventory records.

8. Reconcile recorded sales and royalties paid with income tax returns and other reports containing statements of tonnage mined.

9. Review payroll records and employment records from the standpoint of learning average production per employee and per shift and compare with recorded production for any discrepancies.

10. Review accounts receivable records and for a test period reconcile collections with billed sales and shipments. Be alert for any special sales arrangements providing for quantity shipments at reduced rates which might affect royalty calculations based on an assumed standard sales price.

11. If possible, and if considered necessary, obtain from railroad a summary of shipments for a test period and compare with recorded sales.

12. Agree details of checks received by Weston & Brown with details in check register of Premur Coal Corporation for checks issued.

Answer to Question Number 4

a. The composition of the Y Company's imprest petty cash fund at November 10, 1955 is as follows.

Y COMPANY
PETTY CASH COUNT
NOVEMBER 10, 1955

Currency (bills and coin)		$2,200
Cashed checks		500
Total cash items		$2,700
Less cash deposited in fund but not a part of the imprest fund:		
Return of expense advance	$200	
Sale of money orders (#C1015 to 1021)	100	300
Imprest cash in fund		$2,400
Vouchers		740
N.S.F. checks		260
Total in fund		$3,400
Unexplained shortage		1,600
Total per general ledger		$5,000

Notes: (1) In view of the fact that the representative of the Express Company collects for money orders after issue rather than in advance, blank money orders

#C1022 to 1027 have not been included as a part of the fund.

(2) The vouchers aggregating $400 produced by the custodian on the day following the count should be carefully examined as to authenticity. As they represent wage advances to employees they can be verified by correspondence with the employees. If adequate investigation finds them to be in order, they may be added to the fund and the shortage thereby reduced to $1,200.

b. Because of the apparent shortage, extra precautions should be taken in verifying the various items in the fund. Audit procedures applicable under the circumstances are as follows:

1. Count coin and bills. (According to the terms of the problem this has been done.)

2. Cashed checks should be examined and approval for their cashing investigated. If there remains any question as to their propriety they should be deposited under control and the bank requested to notify the auditors if they do not clear satisfactorily.

3. Vouchers should be carefully examined for authenticity, apparent propriety of the expenditure, erasures or alterations, adequate supporting invoices, and the like. Inasmuch as the total amount is substantial, a sample should be selected, including some the larger items, and if possible should be confirmed directly with the payees.

4. The N.S.F. checks should be examined for apparent propriety and for bank stamps indicating deposit and return. If possible they should be confirmed by direct correspondence with the drawer. The reason for holding the checks for such an extended period should be investigated, and they should be cleared from the fund either as receivables or as losses.

5. The amount deposited as a return of an expense advance should be confirmed directly with the individual concerned to insure that the amount is correct. In view of the implication that other returns of expense advances may have been added to the fund, some investigation of expense advances generally should be made to discover whether this has taken place.

6. The amounts of money orders sold should be checked against duplicate copies or other records. The last report from the Express Company should be examined. All numbers since the last money order reported as issued should be accounted for. Arrangements should be made to meet with the representative of the Express Company to verify that all money orders received from him by the company can be accounted for satisfactorily. At the same time the question of whether blank money orders #C1022 to 1027 were paid for in advance should be answered. If it is impossible to meet with the representative of the Express Company, these matters should be ascertained by direct correspondence.

7. All unclaimed pay envelopes should be opened and the contents counted and reconciled with the payroll records. A list of unclaimed wages should be obtained from the payroll department and compared with the pay envelopes on hand to determine if any pay envelopes are missing.

8. Investigation should be made as to the established amount of the fund and the necessity of carrying an imprest fund of this amount. Recommendations for improvement of the internal control should be made with respect to preparing vouchers in ink, removing unclaimed pay envelopes from the control of the petty cash custodian, and eliminating the practice of depositing returned expense advances in the fund. Any other specific weaknesses discovered during the examination should also be the subject of recommendations for improvement.

Answer to Question Number 5

a. Obtain from company's files copies of internal revenue agent's reports and tax returns from the inception of the company through the last report received. Examine them particularly for adjust-

ments of a material and/or recurring nature.

Obtain copies of Federal income tax returns since the last internal revenue agent's report. Examine cancelled checks for amounts paid, and reconcile remainder with liability account balance. Reconcile income per tax return with net income per books for each year, examining each reconciling item for possible income tax implications.

Consider the possibility of income tax adjustments similar to any found in the review of previous years' settlements.

If any returns are currently under examination by the Internal Revenue Service, discuss with agent any proposed adjustments and consider their influence on past and future tax liability.

Review carefully in connection with your general audit procedures such items as depreciation rates, allowances for uncollectibles, policy with respect to charges for maintenance, betterments and repairs, deferred and accrued items, and the like.

Correspond with the company's counsel and request information with respect to any peculiar tax problems known to the counsel and any litigation related to the company's tax position.

Throughout the review, consideration should be given to the possibility of overassessment of taxes as well as understatement of the liability.

b. (1) The amount of the additional income tax assessment accepted by the Southern Company should be shown as a current liability. Likewise, the expected additional assessments of $20,000 a year for 1954 and 1955 should be shown as a liability because acceptance of the 1952–53 assessment effectively accepts these as well. In order to coordinate the balance sheet liability with the provision in the income statement and the charge to earned surplus for prior years' assessments, the liability may be divided into two parts as follows:

CURRENT LIABILITIES		
Federal income taxes payable		
For year ended December 31, 1955	$420,000	
Additional assessments relating to income of prior years (1952–1954)	70,000	$490,000

b. (2) Under the assumption that company counsel considers the disallowances improper, the company would not include the additional assessments as liabilities, but because of the materiality of the amount involved should disclose by footnote the fact of the assessment. The balance sheet presentation might be:

CURRENT LIABILITIES	
Federal income taxes payable (Note 1)	$400,000

Note 1. The company has been notified by the Internal Revenue Service of additional assessments of Federal income taxes for 1952 and 1953 in the amount of $50,000. Legal counsel advises that these additional assessments are improper and they are being contested.

Answer to Question Number 6

The distinction between balance sheet and other disclosure in a long-form report is not always clear, nor is the extent of desirable disclosure fixed. The following seem to meet the terms of this question.

Accounts Receivable. The balance sheet presentation should show the total amount of receivables classified by major type such as trade, affiliated companies, employees, officers, etc. Any receivables not currently due should be given special classification. An aging schedule showing the amounts currently due and of various ages should be included in the report. The provision for uncollectibles should be shown and a statement as to its adequacy made. The company's experience with respect to uncollectibles as related to sales over the past few years might well be included. The amounts of any accounts receivable pledged, discounted, or assigned should be shown. Accounts receivable turnover rates (or average age of the accounts) should be computed and included.

Inventories. The balance sheet presentation should show the total inventory

classified as to type such as finished goods, work in process, raw materials, and purchased parts. The basis of pricing and, if pricing is on a LIFO or other basis considerably different from current costs, the current replacement market price should be given. Indication of whether the inventory is based on book records or a physical count should be included. Any amounts pledged as security for loans or advances or reserved for specific purposes should be disclosed. Inventory turnover rates should be included in the report and any substantial amounts of obsolete or obsolescent inventory should be disclosed along with the basis for pricing such stock.

Investments. The balance sheet should include the total investments at both cost and market and classified as to temporary and long term. The report could well include a schedule showing for each major investment and for the remainder as a group a description of the security, the number of shares or bonds held, cost, current market value, income earned during the year, and the results of any transactions undertaken during the year. Any securities given as collateral for loans or other obligations should be disclosed.

Property and Equipment. The balance sheet should show at least the total amount, accrued depreciation, and the basis for valuation. The report should include a schedule showing all important classes of property and equipment with an adequate description of the items, the estimated life or depreciation rate, cost, depreciation to date, and insurable and insured values. Any reliable appraisal figures could be included in this schedule. Standby, obsolete, or obsolescent facilities, if material in amount, should be disclosed together with the basis of valuation. Any assets serving as security for notes or other obligations should be shown. Any major transactions occurring during the year and any plans or commitments for future transactions indicated in the minutes of board of directors' meetings should be described.

Current Liabilities. The total of current liabilities properly classified by major types such as bank loans, trade creditors, income taxes, accrued liabilities, and the like should be shown in the balance sheet. If any obligations are particularly important, details of due dates, interest rates, etc. might be included. Any obligations secured by the pledge of specific assets should be indicated.

Long-term Debt. A description including the nature, amount, maturity date or dates, interest rate, and any special features of each obligation should be disclosed. Any obligations secured by the pledging or mortgaging of specific assets should be shown. Any transactions in the current year affecting the long term debt and any firm commitments with respect to future transactions should be explained fully.

Capital Stock and Surplus. For each issue of stock, a description including the type of stock, par or stated value, if any, redemption value if different from par or stated value, any preference features, dividend rates if fixed, and the number of shares authorized, issued, reacquired, and outstanding should be shown. Any shares, whether unissued or treasury, held for special purpose such as sale to employees or issuance to designated officers should be described. For paid-in or other capital surplus, the major sources should be given and a description of the balances. For appraisal surplus, a description of the assets appraised, the basis of the valuation used, the name of the appraiser, and the amount should be included in the report. Any restrictions on the availability of earned surplus for dividends should be indicated. Transfers to and from surplus reserves should be explained and the balance of any such reserves described.

Dividends paid or declared during the period should be shown. Charges and credits to earned surplus for any reason should be explained. Any transactions affecting net worth accounts in any significant amount should be described.

Answer to Question Number 7

Review the internal control over transactions affecting the "Common Trust Fund" and familiarize yourself with the charter of the fund and the trust agreements of the various component funds. Satisfy yourself that inclusion of the component funds is proper. (This should have been done in connection with the previous audit but should be extended to include at least any new funds added this period.)

Obtain a copy of the general ledger of the fund and take a trial balance or check back a copy of a trial balance obtained from the bank employees.

Obtain a bank statement with cancelled checks for December 1955 and prepare a bank reconciliation. Confirm the balance on deposit at December 31 and the existence of any liabilities. Obtain a cut-off statement as of January 10 or later; trace deposits in transit at December 31 into the bank statement; examine checks outstanding at December 31 returned with the cut-off statement; examine other returned checks noting and investigating any which appear unusual.

Examine and count all securities on hand at December 31, 1955 comparing certificate numbers with those in the 1954 work papers where no transactions during the year are indicated. If possible, a schedule of securities held for the fund should be obtained from bank employees in advance and used as the basis for this count.

Either have bank employees prepare or prepare yourself a schedule of securities at 12/31/54, transactions during the year, and balances at year end at both cost and current market values. Check beginning balances against last year's work papers. Verify transactions by reference to minutes of trust department directors' meetings and to original brokers' advices. Compare ending balances with count of securities. Verify market prices by reference to current quotations. Prove extensions and footings. Insure that gains and losses on disposition of securities have been accounted for properly in terms of the trust agreements. Review treatment of such items as stock dividends, splits, and the like.

Use a standard dividend guide for stocks, and interest rates and dates for bonds, to determine the income that should have been received from all securities held during the year. Trace income into cash receipts and trust income.

Compute accrued income receivable.

Review liabilities for accrued expenses and obtain a representation from appropriate officers with respect to unrecorded liabilities.

Analyze major expense accounts and review appropriateness of charges to income and principal. Test transactions by reference to documentary evidence and investigate authority therefore.

Reconcile total of individual small trust funds with the common fund and investigate division of income and capital gains among the component funds.

Examine withdrawals by individual trust funds and payments made to them, investigating authority for each. Make sure that such payments are within the bounds of the specific trust agreement and properly authorized. Review additions to the fund and examine directors' minutes for approvals. Account for cash and securities received.

ASSOCIATION NOTES

E. Burl Austin

EDITOR'S NOTE: Readers of this section are urged to send items eligible for inclusion in these columns to E. Burl Austin, A. and M. College, Commerce, Stillwater, Oklahoma. At intervals, a routine request is mailed asking for this information, but readers need not wait for these communications.

CALIFORNIA

Los Angeles State College

MARY E. MURPHY has been appointed American correspondent for the *Accountants Journal* of New Zealand. MISS MURPHY will attend the National Federation of University Women's meeting in Paris this summer, and she will also attend the coming first session of the International Economics Association this summer in Rome.

ILLINOIS

ROLLAND M. BRISTOR is now a CPA employed as advisory auditor for the Atomic Energy Commission at Lemont, Illinois.

Southern Illinois University

MARY NOEL BARRON has been granted leave for next year to serve as assistant auditor for the State of Kentucky.

RALPH D. SWICK has been appointed professor, and EMERSON C. ERB instructor for the term beginning in September, 1956. Both had previously taught accounting at Indiana University.

Loyola University

THOMAS J. MCCRACKEN and REV. DUMAS L. MCCLEARY have joined the faculty as assistant professors.

ROBERT E. MEIER has been appointed vice-chairman of the accounting department.

IOWA

Drake University

REUBEN A. WAGNER has been granted leave of absence for 15 months to serve on the staff of Peat, Marwick, Mitchell and Co., in Chicago.

M. B. DILLEY will serve as visiting professor at the University of Utah during the summer quarter.

KANSAS

University of Wichita

The annual Petroleum Accounting Conference was held on the campus in April. The program featured speakers from many areas of the petroleum industry, as well as representatives of national firms of CPAs.

MARYLAND

The Johns Hopkins University

ELROY J. SNOUFFER has been appointed lecturer.

SIDNEY DAVIDSON has been promoted to the rank of professor. He will serve on leave during the coming year as visiting lecturer in accounting at the London School of Economics.

LEONARD B. ROWLES has been elected secretary of the Maryland Association of CPAs.

MICHIGAN

University of Michigan

WILLIAM J. SCHLATTER is spending the current school year at the Instituto Post-Universitario Per Lo Studis Dell' Organizzazione Aziendale, Turin, Italy.

Wayne University

For the fourth summer, the university will conduct intensive training courses in electronic computers and their business and industrial applications. Last summer, 400 students from various parts of the country attended the summer program. Nationally known specialists participated as lecturers and discussion leaders.

MISSISSIPPI

Mississippi State College

JOSEPH F. CURRY has resigned to join the staff of Arthur Anderson & Co., Houston, Texas.

NEW YORK

New York University

GOULD L. HARRIS has recently made talks before the following groups: Merrimack Valley Chapter of NACA; Reading, Pennsylvania, Chapter of NACA; Federal Government Accountants' Association; and Nassau-Suffolk Chapter of the New York Association of Certified Public Accountants.

MORTON BACKER, of West Virginia University, will join the faculty as associate professor this fall.

Canisius College

ROBERT G. ALLYN recently resigned as comptroller and treasurer of Winslow Mfg. Co. in Ohio to become associate professor here. ALLYN

recently gave a series of lectures before the American Society of Women Accountants on statement preparation and analysis.

Long Island University

EMSAR BRADFORD, JR. has been added to the staff as a lecturer.

The department held its annual honors dinner in March, at which the title "Honored Fellow of Accounting for 1956" was presented to J. S. SEIDMAN, of Seidman & Seidman, for his outstanding contributions to the furtherance of the accounting profession.

NORTH CAROLINA

Duke University

ROBERT L. DICKENS has returned to the staff after a year's leave of absence spent with Price, Waterhouse & Co., in New York.

WILLIAM J. STEWART, of the University of Melbourne, Australia, is teaching at the university this year.

MARTIN L. BLACK, JR. has received a Fulbright appointment to teach in Canberra University College in Australia. He will leave the United States in June and return at the end of the first semester.

OHIO

The Ohio State University

The Department of Accounting has joined with the Public Accountants Society of Ohio and the Ohio Society of Certified Public Accountants in cosponsorship of a series of conferences on accounting theory and practice for the benefit of public accountants in Ohio.

ERIC L. KOHLER served during the winter quarter as a visiting professor.

HOWARD C. GREER is a visiting professor during the spring quarter.

WILLIAM M. SLOCUM, formerly with Peat, Marwick, Mitchell & Co., is a new instructor on the staff.

LEO D. STONE will move shortly into the Department of Business Organization.

JAMES R. MCCOY has been appointed Chairman of the department to succeed the late HERMANN C. MILLER.

The Eighteenth Annual Institute on Accounting was held on the campus in May.

Western Reserve University

T. M. DICKERSON, chairman of the department, and OSWALD L. NIELSEN, of Stanford University, arranged an exchange professorship for the coming summer.

OKLAHOMA

Tulsa University

The university was host in April to the Tenth Annual Conference of Accountants. The program featured outstanding speakers from the field of industrial accounting, as well as public accounting.

PENNSYLVANIA

University of Pittsburgh

H. J. PHILLIPS has been appointed lecturer in accountiug.

D. R. DILLEY has resigned from the staff.

L. A. WERBANETH, JR. spoke before the Pittsburgh Chapter of the Institute of Internal Auditors on employee tax problems.

W. W. FRASURE and J. H. ROSSELL spoke at two recent management conferences for heating and air conditioning dealers.

F. VAN SCOYOC passed the November CPA examination.

WILLARD E. STONE has been elected to the Grand Council of Beta Alpha Psi.

TEXAS

University of Texas

GLENN A. WELSCH and JIM G. ASHBURNE are presently serving as president and secretary, respectively, of the Austin Chapter of the Texas Society of CPAs.

The following staff members have made speeches before the following groups:

C. AUBREY SMITH, joint meeting of East Texas Bankers and CPAs;

GLENN A. WELSCH, joint meeting of San Antonio Bankers and CPAs;

CHARLES T. ZLATKOVICH, Central Texas Chapter, Texas Association of CPAs;

JOHN ARCH WHITE, North Carolina Association of CPAs, Texas Association of University Instructors in Accounting, Texas A. and M. Accounting Conference, and the Tulsa Accounting Conference;

ROBERT L. GRINAKER and DALE S. HARWOOD will join the staff as assistant professors in September.

Texas A. and M. College

The Ninth Annual Accounting Conference, sponsored jointly with the accounting organizations in Texas, was held in April here at the university. Speakers were presented who were especially qualified in the area of accounting dealing with management problems.

BOOK REVIEWS

ARTHUR M. CANNON, *Editor*

Accounting

Auditing

General

Management

Accounting

DONALD P. PERRY, *Public Accounting Practice and Accounting Education* (Cambridge: Harvard University, 1955, pp. xii, 65, $1.50).

Mr. Perry is the fifteenth lecturer at the Harvard Business School under the auspices of the Arthur Lowes Dickinson Fund, which was established in 1929 by Price, Waterhouse & Co. A partner in Lybrand, Ross Bros. & Montgomery at Boston and, in 1955, a vice president of the American Accounting Association, Mr. Perry joins a distinguished company.

The present volume contains the two lectures given last fall. The scope of the discussion of *current professional practice* may be understood from the following headings:

The Growth of the Profession
The Place of Accounting in the Business World
Areas of Public Accounting Practice
Present Day Approach to Auditing
Services Other Than Auditing
Professional Responsibilities and Independence

Certainly of very general interest are Mr. Perry's views on the present day approach to auditing. In some ten pages he comments briefly and clearly on such items as generally accepted accounting principles, the auditor's need to be fully acquainted with the client's operations and policies, and the necessity of an understanding of our economy as a whole. Attention is focused on recent auditing developments classified "under three heads: first, responsibility for discovery of fraud; second, crystallization of auditing standards; and, third increased recognition of criteria of materiality." Emphasizing the decrease in "detailed checking," the development of internal auditing departments, standards of personal competence and independence of attitude, and increased attention to materiality, the lecturer highlights the transition from the old order to the new in the auditing field.

The comments on services other than auditing should be of interest to both the professional accountant and the layman. Welcome, indeed, is the warning that there is danger in undertaking too many specialties.

In summarizing his first lecture Mr. Perry states "first, that public accounting as a profession is still in a dynamic period of development paralleling the vigorous advances taking place in our complex industrial system and in the managerial methods for directing that system; secondly, that auditing practice has become much more than the following of routine steps of examination, calling for a high order of informed judgment based on recognized general standards and on broad understanding of business organization, business methods, and business relationships; and thirdly, that professional responsibilities of accountants, including consulting work, should be governed by viewing such work in proper perspective, by understanding cooperation with other specialists and by a high order of personal integrity."

The second lecture on *accounting education* is presented under the following major headings:

The Present Varied Educational Pattern
Problems in Present Accounting Education
The Need for Professional Programs
The Accounting Subjects
The General Educational Pattern
The Problem of Uniform Requirements

In the press and from the platform we are not without evidence that in matters educational (primary, secondary, and higher) there are many "experts." It follows that no one will agree completely with Mr. Perry's position. It is not unreasonable to expect that from some of those who cannot, for example, distinguish between (1) *experience as a prerequisite for admission to the C.P.A. examination* and (2) *experience as a prerequisite to engaging in practice as a C.P.A.* will come firm disapproval of some of his statements.

We are constantly reminded of the hazard inherent in quoting out of context. With a fond hope that no violence be done, the following bits are presented as illustrative of the color and forthrightness of the discussion under review.

"It is generally agreed that by and large the best formal preparation for public accounting is now pursued in the collegiate schools of business, including undergraduate work, post baccalaureate study, or both."

"There has not been time for accepted standards of education to evolve as in the older professions, such as law and medicine, which themselves went through confusing periods of development before their present programs of education emerged."

"Obviously teachers should make every effort to keep in touch with developments in practice, just as it is a responsibility of practicing members of the profession to keep actively interested in the educational and research activities of its academic members."

"While in some schools practicing accountants now devote part time to teaching, such arrangements might well be extended, particularly where leaders and senior members of the profession with tutorial abilities might be more extensively drawn into the educational picture, so long as the solid body of a permanent faculty is not weakened by overreliance on part-time instruction."

"Auditing has been called a difficult subject to teach and auditing courses have been subject to more criticism by the practicing profession than any others in the accounting field. This criticism stems probably from an unwarranted expectation on the part of employers that the student who has completed an auditing course should be ready to find his way about an unfamiliar set of accounting records and to plan and execute an examination of them."

"Many accounting curricula would profit by concentrating on basic intensive courses rather than overextending into such applied courses as principles of real estate accounting or the theory of stock brokerage accounting."

"But again instruction in taxation should be limited to central and basic aspects rather than including details of law and regulations which even the specialized tax practitioner does not attempt to carry in his memory."

"After all, the particular problems and cases which might be presented in an accounting curriculum would not exhaust the field in a lifetime of study. The student should realize this and understand that a career in any profession calls for continuing study and research."

"Liberal education will place a man on an equal social and intellectual footing with other professional people—educators, lawyers, doctors, and engineers, as well as with top business executives."

"So the purpose of study of the liberal arts is not to acquire a store of facts but rather ideas and attitudes and particularly a set of standards which enable the educated man to recognize the first rate in any field, including his own."

"To me the most fruitful direction for a solution is to see that academic work concentrates on principles, problems, and methods of solution, leaving the practical answers, detailed applications, and factual material to be learned later on the job."

In attempting to present *Public Accounting Practice and Accounting Education* in two lectures, Mr. Perry essayed a formidable task. It is the judgment of this reviewer that he deserves a "well done."

Reviewing the first three Dickinson Lectures some fourteen years ago, the present writer expressed a thought which may well be repeated here: "The accounting profession is indebted to those responsible for the decision to publish these lectures in a form available to the members of the profession and to the public at large."

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RESEARCH DEPARTMENT, AMERICAN INSTITUTE OF ACCOUNTANTS, *Accounting Trends and Techniques* (New York: American Institute of Accountants, 1955, pp. 266, $10.00).

This ninth annual survey of the accounting aspects of 600 corporate annual reports relates to fiscal years ending between May 1, 1954 and April 30, 1955. The list of industrial and commercial companies included in the survey remains fairly stable from year to year.

Significant accounting trends, as revealed in the reports of the selected companies, are the subject of extended comment in the text of the survey, supplemented by numerous comparative tabulations. The task has been well performed.

A contemporary business magazine (*Management Methods*, March 1956 issue) states: "Corporate financial reports are becoming increasingly streamlined and informative according to a survey of the annual reports of 600 typical corporations." (The reference is to the AIA survey.) In support of this conclusion there are listed ten areas in which the publication notes significant trends toward greater uniformity or more complete disclosures of pertinent information.

The first of these refers to the increase in the use of "single-step" income statements in which total expenditures are subtracted from total income to show net income. Here it is found that 41% of the survey reports now use this form as compared with only 21% when the survey began in 1946. What is not disclosed, however, is that in 1954, 16 companies *adopted* the single-step form of income statement and 11 companies *abandoned* it in favor of the multiple-step form. Thus the net gain of 5 during the period is less than 1% of the total.

It should be emphasized that in four of the ten areas commented upon substantial progress has been made since the survey was undertaken more than nine years ago. Thus it is noted that:

74% of the reports presented financial information on a comparative basis for more than one year compared with 41% in 1946;

80% furnished additional financial information beyond that included in the audited statements as against 67% in 1950;

79% used "income" or "earnings" to describe the income statement, with only 13% using the older term "profit and loss"; and

56% used "retained earnings" or similar captions in comparison with 17% in 1948 before the Institute recommended the desirability of replacing the term "earned surplus."

In the remaining five categories (two of which are not significant) it is evident that anything approaching reasonable uniformity is a forlorn prospect. Only 37% present a combined statement of income and retained earnings, 20% have abandoned the title "balance sheet" for the more modern "financial position" or "financial condition," and 41% used a caption such as "stockholders' equity" in place of "capital stock and surplus."

The slow progress that has been made in the establishment of definite standards by which published financial statements can be measured is the subject of a forceful article in the January 1956 issue of THE ACCOUNTING REVIEW by Howard C. Greer. Where does the fault lie?

This reviewer believes that the major responsibility for slavish adherence to outmoded financial accounting practices rests in top management of publicly-owned companies. Individual whim, reluctance to discard traditional presentations, and plain lethargy are roadblocks sometimes encountered when the enlightened comptroller and the independent public accountant discuss improvements in financial reporting techniques with senior officers.

After all, however, gradual progress is undoubtedly being made both as to improved form and nomenclature and more informative disclosures. The investing public collectively are receiving in general much more satisfactory financial information than ever before. About the only feasible way of accelerating the current rate of improvement seems to be the prescription of rigid financial reporting rules by governmental agencies—which Heaven and Howard Greer forbid!

The American Institute of Accountants is to be commended for its annual presentation of this survey—which has proved to be so useful to financial officers, practicing accountants, teachers, and students.

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Proceedings of the Seventeenth Annual Institute on Accounting (Columbus: Bureau of Business Research, The Ohio State University, 1955, pp. 120).

The Seventeenth Annual Institute on Accounting assembled on May 19, 1955, with 353 persons registered from 12 states, the District of Columbia, and British Columbia, roughly classified as follows:

Educators	15.6%
Industry	30.9
Government	1.7
C.P.A. Firms & Others	51.8

This meeting is the occasion taken by The Ohio State University Department of Accounting for announcing its current election to the Accounting Hall of Fame: Percival F. Brundage, former senior partner of Price, Waterhouse & Co. and presently Director of the Federal Budget.

Eight major addresses were delivered:

Percival F. Brundage, "Federal Budget Procedures"
Willard J. Graham, "Application of Declining-Amount Methods of Depreciation"
C. R. Fay, "Developing Accounting Practices Among Executives"
Frank W. Lennon, "Development of Internal Auditing"
Philip Sporn, "Electric Power in Two Decades Ahead"
T. T. Shaw, "Changes in Income Tax Accounting"
John F. Costelloe, "Provisions of the Internal Revenue Code of 1954"
Everett D. Reese, "A Banker's Viewpoint of the Nation's Economy"

Brundage divides his discussion of federal budget procedures into three main areas: (1) preparation of the budget, (2) authorization of programs and obligation of funds by the Congress, and (3) performance of the executive branch. He points out some of the factors which have influenced the budget under the Eisenhower administration, emphasizing the impact of NATO and the desire to get the Government out of activities which compete with private business. He is especially critical of the time and energy which department heads seemingly must spend in justifying their expenditure and revenue measures before the Congress.

An interesting commentary by Brundage in his closing remarks implies that although government expenditures have been reduced, the world situation confronting the United States probably makes it impossible to cut them as drastically as he had hoped. Other newcomers to government service, after being exposed to the complexities of our governmental processes, have indicated similar thoughts. Perhaps this should be a sobering thought for those of us who are quick to criticize and at best are only partially informed.

Graham's summary remarks on declining-amount methods of depreciation make sound accounting sense. He emphasizes that such methods should be used only in the determination of taxable income, unless a proper allocation of facility cost to successive accounting periods results from their use. He further points out that if some such method is sound accounting, then it should apply to properties acquired prior to 1954, as well as to those acquired subsequently.

If declining-amount depreciation is sound in principle, Graham urges that a correction be made on the books for depreciation deficiencies on pre-1954 acquisitions. "The resulting charge to retained earnings or to income 'below the line' should be offset to the extent of about 50 per cent by the creation of a deferred charge in the nature of prepaid income tax." In spite of this last proposal, the *AIA Research Bulletin*, and previous statements by others on the allocation of income taxes, a strong argument can be made that taxes on earnings are period charges, and therefore, the amount of the tax as computed in the return for the year should be the reported tax in the income statement. An explanatory footnote could be attached to the statement as deemed appropriate, but income tax expense, it can be reasonably argued, is a definite and clear period charge.

Fay admirably presents the problem of communicating with the nonaccounting executive about accounting methods, reports, and possibilities in the area of planning and control. He suggests that an accountant needs to be a "technician, teacher, counselor, and psychologist," and further points out the areas enumerated above as those which deserve special attention in educating the executive.

Lennon traces the development of internal auditing and discusses the function of the internal audit as well as the role of the internal auditor. He suggests a closer collaboration between the internal auditor and the public accountant, particularly in the area where each may bring to the project his own special knowledge and experience.

Sporn points out the importance of electric power to economic progress and enters a special plea for accountants to assist in uncovering "the hidden facts" of subsidized power through figure analysis.

Shaw and Costelloe review some of the changes in the 1954 Code and occasionally suggest answers to some of the unanswered questions raised by the Code. For example, Shaw criticizes the action of responsible members of the accounting profession who "initially took the position that taxpayers should not be required to place on their books expense reserves they were claiming for tax purposes." He points out that the principle of section 462 is sound and challenges the accounting profession to new efforts to get some such provision enacted into law for accounting reasons and not merely for purposes of new tax deductions.

Reese outlines some of the recent economic developments and discusses the role of the businessman in helping "to create a better understanding on the part of the masses of the people as to just why they do enjoy such a high standard of living."

The addresses were interesting and timely and represent a substantial contribution to accounting literature.

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EDWARD J. KELLY, *The Accounting Process* (San Francisco: Fearon Publishers, 1956, pp. xvi, 458, $6.00).

Dean Kelly says his book is intended to substitute for the "mechanical, bookkeeping approach" a development of the concepts and assumptions underlying the preparation of financial statements. The result is a two-semester introductory college text with many details of bookkeeping procedure omitted. Also there are no references to payroll or income tax calculations. There is no explanation of reversing entries (in spite of the fact that one appears on page 97). There is no comparison of perpetual and periodic inventory bases, but they are listed as alternatives on page 247. And there is no reference to the aging of receivables as an approach to bad debt estimation.

Explicitly for the same reason, manufacturing "bookkeeping" and many details about partnership and corporation accounting do not appear. Nor are the common introductory accounting subjects of branch accounts, budgeting, and financial statement analysis to be found in this book. On the other hand, three chapters are given to subjects not commonly found: (1) the retail method of inventory valuation, (2) consignments, and (3) installment sales.

As a result of these departures from usual content, the text has been held to 316 pages (provocative questions and adequate problems fill the remaining 134 pages to the index).

The remaining subject matter is presented in a conventional order. The first twelve chapters (intended for one semester) present the substance of the bookkeeping "cycle." They are interspersed, of course, with the necessary definitions and include extended discussions on classification and measurement of revenue and expense.

Interesting features of these early chapters include a description of classes of "services" (assets and/or expenses); introduction of valuation accounts via contra revenues; presentation of alternative forms of financial statements with emphasis on points-of-view involved; extensive justification for conventional practices; and criteria for choosing between alternative methods. Mathematics is both strength and weakness. It is used to good effect in the early presentation of transactions "equations" and in a later algebraic explanation of work sheets. But its usefulness is exhausted before it is abandoned; one may wonder what is gained by stating $A=L+P$ as on page 13:

$$\sum_{i=1}^{i=n} \$A_i = \sum_{j=1}^{j=m} \$L_j + \$P.$$

Other unnecessary complications in these chapters include three cash discount methods; four separate valuation accounts for returns, allowances, discounts, and uncollectibles; a questionable concept of valuation accounts for *cash;* and the discounting of *drafts*.

The remaining fourteen chapters (intended for a second semester) continue the subject of income measurement and introduce new subjects. The first two of these, dealing with classification and correction of errors and with the time period distribution of revenue and expense, are in general excellent. Some readers may quarrel with the author's avoidance of the all-inclusive income statement, and with his view that some costs and revenues can be "matched" only in the sense that they can be identified with the same "period."

The three chapters on inventory valuation and depreciation methods are of fair quality. The whole chapter on retail method is so mechanical in nature as to be incompatible with the author's avowed purpose; however the chapter is clearly written. Depreciation methods are effectively distinguished by graphic presentations. In these chapters preferences for cost-or-market and service-units methods are indicated.

Special journals are covered with varying degrees of success in the next three chapters. A very excellent feature is a discussion of journalizing and posting short-cuts. Disappointing is a chapter consisting of two text-pages on invoice and voucher registers, in the latter of which debits are limited to merchandise purchases.

The book virtually reaches its end with two excellent chapters on management classification of data on functional or departmental lines. Alternative bases for classification are noted; direct and indirect costs are defined; and a preference for "contribution-approach" statements is indicated.

As might be expected in a first printing of a new book, mechanical errors abound. The fifty or more errors in calculation, amount, cross-referencing, etc., that might confuse students will soon be removed. One might also hope that the more repetitive mathematical proofs or demonstrations might be left out so that the inherent strengths of subject matter selection and order might be emphasized. Already tabular and graphic illustrations are of a high quality; and the bulk of the text is "teachable" and "readable."

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JOHN J. W. NEUNER and ULRICH J. NEUNER, *Accounting Systems—Installation and Procedures*, Second Edition (Scranton: International Textbook Company, 1955, pp. x, 508, $7.50).

This is a revision of the text of the same title published in 1949. The general organization used in the first edition has been retained, but with some changes in the sequence of materials and additional emphasis on the design and use of business forms and mechanization of accounting procedures. Some additions in the applied accounting systems section have also been made.

Some of the earlier texts in this area of "systems" were essentially a compilation of the characteristics and accounting peculiarities of specific types of business enterprises. More recently books in the field have tended to deal more with fundamental objectives and methods of design and installation, a trend with which the reviewer is in accord. The present authors apparently have taken the position that both of these approaches have merit, and have therefore covered principles and procedures in the first part of the book with

a final six chapters devoted to application to specific businesses.

Part I, "Principles and Procedures of Accounting Systems Work," includes fourteen chapters covering 356 pages. The first chapter serves as an introduction to the field. Included is a list of seven "principles" underlying system installation work. To the reviewer these do not appear to be principles of systems work, but rather a list of the steps of the bookkeeping cycle in chronological sequence, with certain emphasis on internal and external control.

Chapter 2 is devoted to the nature and importance of business forms in accounting work. It includes basic principles of form construction and introduces the techniques of forms surveys and analyses. Chapters 3 and 4 deal with the utilization of mechanical equipment in accounting, including punched-card accounting methods.

The next two chapters illustrate most of the forms of journals, registers and ledger rulings, with concise explanations of their operation and purpose. Although these chapters serve a very useful purpose, the reviewer was disturbed by some of the statements found in this section. The classification of prepaid expenses outside the current asset section, and the inclusion of cash discounts as "other income" and "other deductions" respectively, with no comment as to alternative possibilities, may be irritating to some.

In chapter 7 the several steps in systems design and installation are outlined and discussed. Although most people presumably would agree that the first step should be a preliminary survey of the business, one might question the sequence of the next four steps which are stated as follows: "(2) analysis of the forms, records, and procedures of the transactions of the business; (3) books of original entry—journals; (4) books of final entry—ledgers; (5) reports for executives from accounting records." The reviewer, for one, would essentially reverse steps (2) through (5) in a systems assignment.

The accounting and systems problems relating to certain basic procedures in accounting are presented in four chapters: purchases and inventories, payrolls, sales and cash. Throughout these and other chapters the authors rightfully emphasize the importance of developing an adequate system of internal control.

Part II is devoted to "applied accounting systems and procedures," one chapter dealing with mercantile firms, two with manufacturing concerns, two with service types of businesses, and the final chapter with "simplified systems" for retail and service businesses and for professional men. This latter chapter is devoted largely to a presentation of the "ready made" records that can be purchased for such small enterprises, consisting of columnar journals or registers, together with certain summary sheets in lieu of a formal ledger. Because these "systems" are designed to be used by small firms who have no one trained in bookkeeping or accounting, they must be essentially self-explanatory to the uninitiated. One may question the desirability of including this material in a book on system design and installation.

The chapter on applied systems for mercantile firms deals with department stores, wholesalers, and chain stores. Chapter 16 is essentially an introduction to cost accounting, with an outline of the basic procedures for job order and for process cost systesm. Chapter 17 is devoted to a brief description of the nature of, and the peculiar accounting problems arising in, five specific manufacturing businesses—soft drink bottlers, brewers, distillers, clothing manufacturers and magazine and newspaper publishers—a total of eight pages!

Chapters 18 and 19 deal with special accounting problems of the service type of enterprise. Each of the following is discussed briefly: stock brokerage, commercial banks, insurance agency and brokerage firms, laundries, hotels, restaurants, real estate firms, counties (as an example of municipal accounting), and motion picture theatres.

The text concludes with a very useful appendix giving a partial directory of systems information which is available from producers of accounting forms and equipment, trade associations, and from governmental regulatory bodies.

Following each chapter is a series of questions for review, and also a group of problems which may be assigned to assist the student in developing and applying the principles and methods of systems work, including a term project. Both the questions and problems appear adequate and are well designed.

Accounting Systems—Installation and Procedures continues as one of the few but much needed books in the field of system work. For those who desire a text presenting the principles and methods of system design and installation, combined with materials illustrating their application to particular businesses, the book should serve a useful purpose.

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Harold F. Craig, *Administering a Conversion to Electronic Accounting* (Boston: Harvard Business School, 1955, pp. 224, $2.50).

This work is a study of personnel attitudes during the installation of a punched card system in a large insurance company.

There is a brief description of the clerical operations in the company before and after the change. The author then outlines the change from an organization based largely on geographical divisions, with some special functions, to an organization strictly on functional lines. The conversion took four years, 1950–1953. The number of clerks dropped from 539 to 406. The average weekly salary rose from $37 to $49. The volume of work processed remained about the same. Total cost, including equipment rental, rose slightly.

However, more reports were available. Work was processed faster and more accurately. Also Craig estimates that as many as 100 clerks may have been eliminated from field office operations. The primary "aim of the study was to gain knowledge and understanding of the impact of this technological change upon the human organization and to gain some insight into the

administrative skills which facilitate the introduction of such new procedures into medium and large-size organizations." The major part of the text deals with conferences and conversations among officials and with the author. Lengthy quotes appear. Some of the material is only distantly related to the conversion. As an example, there is an extended discussion of the problems which arise because some employees come to work late.

The insurance company promoted on seniority wherever it could. It was so careful of employee rights that it shaped its organization to fit their needs. For example, the study showed that six divisions was the best way to handle the work after the machines were installed. Since there were seven managers in the old set-up, seven divisions were created in the new (later expanded to eight).

Craig is impressed by the careful way the conversion was handled. Continual conferences, employee orientation, assurances of wage maintenance, etc., win his praise. Three years were spent in testing and preparation. As mentioned, four more were required to make the change.

The result was a minimum of human friction. The new system works well and is liked by the employees.

Craig's study is particularly interesting because most books on the subject concentrate on the technical side of conversion. More work of this type will help us handle the heavy problems of conversion to electronic computers, where the impact on employees is certain to be greater than that to punched cards, and where more facets of the organization will be affected.

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The Punched Card Annual, Volume IV, 1955–1956 (Detroit: Punched Card Publishing Co., 1956, pp. 189, $7.50).

This is the fourth volume in a series "dedicated to the advancement of the science of tabulating systems." The annual task of compiling a group of articles, all dealing with essentially the same subject, and a very specialized subject at that, must be a difficult one. Since tabulating machinery is now in such widespread use, one may never run out of material, although there is great danger of being repetitious. The editors have tried to avoid this pitfall, but have not succeeded entirely.

The material in this volume can be classified as follows:

	Number of Articles	*Number of Pages*
a. Articles describing various companies' punched-card accounting systems	30	109
b. "News" articles on new equipment, forms, or standard applications	24	21
c. "News" articles on accessory equipment	31	12
d. Technical articles or notes on tabulating short-cuts and machine techniques	19	15
e. Articles dealing with the general field of record-keeping and data-processing	5	25
f. Sample survey of specific applications in use, by industry	1	7

The previous three volumes in this series were very similar in content, although there has been some attempt at variation by the inclusion of a "special feature." Volume I, for example, had an interesting article tracing the history and development of punched-card equipment. Volume III contained a nation-wide directory of tabulating "experts" with their fields of competency. The "feature" of Volume IV is the last article listed above (item *f*), "Machine Accounting Forecaster," surveying specific applications in use.

The Punched Card, in describing the latest in machines, forms, and accessory equipment, provides a clearinghouse for information on new products in the field. To a great degree, however, this is overlapped by material published monthly in *Office Management*, *Office Executive*, *The Office*, and the house organs, *Systems* and *Paperwork Simplification*. Thus, by the time material appears in *The Punched Card*, it is no longer news, but it is in the category of reference material.

Probably the most important contribution this publication makes is the dissemination of technical material on machine techniques (item *d*, above). However, the editors, in realization that material of this nature has limited readership appeal, have assigned only a small part of their space to it. The few articles dealing with the field of data-processing in general have the highest interest-value of all.

But by far the bulk of the material consists of descriptions of specific tabulating installations, and it is here that editorial discretion might improve the publication. The machine applications described range from the brilliant to the tedious.

Some of the applications described command one's attention, even though (or perhaps, because) they relate to problems outside one's own experience. Examples of some unusual systems are:

Aircraft and flight-crew records
Calculating crude-oil run tickets
Library book control
Radio communications accounting
Mechanized rail-car reporting
Narcotics control (appeared in a previous issue)
Machine loading (previous issue)
Statistics—research in a law-enforcement agency (previous issue)

Unfortunately, most articles relate to everyday problems, such as order-writing, invoicing, payroll, expense distribution, and so forth. While applications such as these do constitute the bulk of tabulating installations, for that very reason they are no longer news nor warrant writing up as such.

If this were not a periodical, there could be justifi-

cation for inclusion of articles on "everyday" applications. But it is hard to understand, for example, why the present volume should carry four articles on payroll systems, and five on billing, especially since previous issues had eight articles describing payroll systems, and 27 on billing and orders.

If the fact that there were three previous volumes could be overlooked, Volume IV fares much better standing alone. It presents a comprehensive survey of tabulating applications and the field of mechanized accounting in general.

This represents an opportunity for one not versed in machine accounting procedures to obtain a painless introduction to the field. For someone contemplating a tabulating installation, *The Punched Card* can be a morale builder, because it contains so many success stories.

But if you already have Volumes I through III, there is a question whether Volume IV is worth the expenditure of $7.50.

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Auditing

JENNIE M. PALEN, *Report Writing for Accountants* (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1955, pp. 602, $6.95).

Audited statements result from the joint effort of both internal and external accountants. The former are part of management and are responsible for the initial preparation of the statements and supporting schedules and notes. The latter are independent public accountants retained by the owners of the enterprise to express their opinion as to the fairness of such statements in accordance with accepted principles of accounting after appropriate review and examination. In the course of such examination independent accountants frequently find it necessary to edit, change and at times take exception to the accounting principles or reporting standards on which the statements are based. In addition, the examination may reveal minor or major weaknesses in internal systems, methods and procedures which should be brought to the attention of operating staff or top management, or both. How may this information best be presented and what additional data should be included in the auditor's report to make it meaningful and helpful both to management and third parties?

Report Writing for Accountants addresses itself to this problem of the principles and techniques involved in preparing and reporting on financial statements. Chapters 1 and 2 cover briefly the responsibilities of the independent auditor and the uses and structure of the audit report. Chapters 3 through 15 are concerned with the conventional discussion of classification and valuation of the usual items included in the balance sheet and income statement. Of particular interest to the active practitioner, however, are chapters 16 through 19 which are replete with carefully selected illustrations of the many different types of "long-form" audit reports. The form and content of these reports and comments contained therein are analyzed and critically appraised. Four chapters are devoted to the independent accountant's fornal opinion. Of special interest is the chapter concerned with "Disclaimer of Opinion." The book continues with a discussion on techniques of report writing and closes most appropriately with a chapter on review, typing and delivery.

This is an excellent work and should prove a most valuable reference source for accountants and others concerned with the preparation and audit of financial reports.

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ARTHUR W. HOLMES, *Auditing Principles and Procedures*, Fourth Edition (Homewood, Illinois: Richard D. Irwin, Inc., 1956, pp. xiv, 808, $6.50).

The fourth edition of this well-known work, as were the earlier editions, is designed as a textbook in auditing at the undergraduate level. Like its predecessors it starts out with fundamental concepts and goes through the entire series of events up to and including the discussion of the form and content of audit reports. Unlike its predecessors it contains a chapter covering a relatively recent addition to the area of activity of professional accountants, namely management consulting services.

Certain features of the work are admirable, particularly the excellent interweaving of the internal control questionnaire as it relates to the various phases of an audit. Three types of illustration are included in almost every chapter, the internal control questionnaire, working papers appropriate to the subject matter of the chapter, and "cases" illustrating, for the most part, inadequate internal control. Some users of the text may wish the author had devoted some space to a full blown discussion of the internal control questionnaire as an auditing tool. Others may miss, particularly, comments upon the shortcomings of the "yes"-"no" form of questionnaire with special reference to repeated use on the same engagement.

The illustrative cases constitute an excellent pedagogic device for driving home an understanding of what to look for in the various phases of an audit. Each chapter is folllwed by a series of questions and problems which account for 181 pages out of a total of 796. With rare exceptions the questions are excellent, from the point of view of requiring a student to think through what procedure should be followed in a given situation,

as well as why that procedure is the best of available alternatives.

Following the pattern of the third edition the author is not hesitant in expressing his opinion in those areas where he has taken a firm position. As an instance may be cited his strong defense of the cost-or-market rule of inventory valuation. Throughout the text accounting theory is brought into the discussion, but is always subordinated to the primary objectives, auditing principles and procedures.

Certain mechanical features of the book make it more readily usable than its predecessor editions, particularly the variety of type styles and sizes, and the sectionalizing of the subject matter in chapters. There is also an improvement in the sequence of the first five chapters.

The text is accompanied by an excellent set of audit working papers to enable the student to become familiar with what he will find to be a part of his daily work in professional accounting.

Beginning on page 178 the author discusses testing and sampling. What is written had much better been omitted because the discussion ignores completely modern statistical sampling theory and contains statements about the characteristics of a sample which are not referred to any criteria by means of which the size of a proposed sample may be determined. "The audit program . . . is as follows:" appears on pages 182, 184, 188, and 190. In each instance it is followed by one or more statements that a sample of "about 25 per cent of the items" should be vouched. In no case is evidence offered to show why precisely a 25 per cent sample yields acceptable results. Would a smaller sample do just as well? Perhaps this situation does no more than emphasize the general weakness of the theoretical foundations of the sampling procedures conventionally adopted by independent accountants in their capacity as auditors.

The coverage of the details of an audit program, whatever the size of the engagement, is most complete from the point of view of the student. It might be advantageous to have the things to be done in an audit program grouped with reference to checking of arithmetic, review of original documents, etc., rather than a seriatim listing such as is found, for example, on pages 222, 223, 260 and 262–263, and near the beginning of almost all the chapters of the text.

Throughout the work reference is made to auditing standards, including, of course, the 10 standards proposed by the American Institute of Accountants. To these ten the author has added an additional 25. It would be helpful to a reader to know from what source they come, who is responsible for them, and to have a discussion of their importance in an audit program.

On balance, the excellent qualities of the work far outweigh their opposites, and any student of auditing principles and procedures will find this edition of Holmes' a worthwhile addition to his professional library.

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ARNOLD W. JOHNSON, *Principles of Auditing* (New York: Rinehart & Company, Inc., 1955, pp. x, 400, $6.50).

In the preface the author says that this text is intended to serve both the student and practitioner. It is directed to two groups of students, (1) those planning to enter the profession of public accounting, and (2) those desiring a general understanding of auditing as a background for future careers in business. It is also intended that the book will be (3) a guide for young accountants in practice as well as (4) a reference book for seasoned professional auditors. This seems to be an ambitious undertaking to accomplish in a book of 400 pages.

The book is organized into eighteen chapters and two appendices. The first three chapters deal respectively with the general nature and objectives of auditing, elements in planning an audit (staff organization, work papers, etc.), and internal check and control. The specific application of audit techniques, procedures and audit standards in the verification of the balance sheet and income statement, and the presentation of illustrative work papers, are covered in the following eleven chapters (4–14). The next three chapters (15–17) deal with the preparation of audit reports. Chapter 16 emphasizes standards of financial statement presentation while chapter 17 presents some illustrative short-form reports and a long-form report. Chapter 18, which is devoted to the application of statistical methods to auditing, was written by John Neter, Associate Professor of Business Statistics, University of Minnesota. An illustrative detailed audit program is included in the book as Appendix A, while a representative form of internal control questionnaire is presented in Appendix B.

At the outset the author makes it clear that the financial statements being examined are the representations of the client (pp. 4 & 10) and this matter receives further attention on p. 283—an important point on which students tend to be confused.

Unlike some auditing texts, which resemble encyclopedias of audit procedures, this book deals more with audit standards and objectives, as well as reasons for the application of certain procedures. This feature has enhanced its readability. At the same time, the reader gets a good idea of typical audit procedures and the elements of internal control by reference to Appendices A and B. Good examples of audit working papers are presented throughout the book. Although the stated intention of the author is to emphasize "principles of auditing" rather than "principles of accounting," he evidently could not resist occasional comments in the interest of sound accounting theory, such as on p. 168 (prepaid interest), p. 171 (unamortized bond discount), p. 239 (discount on capital stock), p. 252 (earned and realized income), and p. 209 (allowance for purchase discounts).

The book is well supplied with footnote references to professional literature relating to such matters as audit standards, audit procedures and generally accepted accounting principles. A collateral reading list appears at the close of each chapter. Although the book does not include any questions or problems, the author has evi-

dently intended his separate *Case Problems in Auditing* to fill this gap (New York: Rinehart and Company, Inc., 1950, pp. x, 259).

Such features as the discussions on pension liability (pp. 233–234), post balance sheet events (pp. 283, 284, 285), the all-inclusive income statement (pp. 297, 298, 299), footnote references to recent professional literature and articles and statistical methods in auditing, (Chapter 18), all lend to the book a modern and up-to-date approach. On p. 341 (Chapter 18), Mr. Neter indicates that, ". . . the appropriate sampling plan may be obtained from prepared tables. . . ." Because of the importance and current interest in statistical methods in auditing, it would have been helpful if some examples of these prepared tables had been included, with an illustration of their application.

Because of the importance of understanding the nature of audit evidence and the techniques of obtaining and evaluating such evidence, it appears that the book might well have had a chapter focusing specifically on this problem. Although the author gives some recognition to the field of internal auditing (pp. 53–54), it appears that further discussion on the nature and importance of this activity, as well as its relationship to the public accountant, might have added to the understanding of the reader.

There is one feature of the book which annoys the reader by giving him the impression that financial statements possess mathematical finality rather than being the product of judgment. This arises from the author's continued use throughout the book of such words as "correct" and "incorrect" (pp. 5, 7, 9, 164, 186, 218, 237, 251, 253, 295, and 318), "proper values" (pp. 191, 246), and "truth" (p. 271). On p. 204 the student may be momentarily saved when he reads "except for cash, the valuations of the assets of a balance sheet rest upon the factor of opinion." The student may encounter terminological difficulties in reading the following (p. 252): "Some expenses may have been recorded but not consumed. . . . Some expenses may have been consumed but not recorded. . . . Expenses may have been erroneously included in cost of sales." Having cautioned the student to avoid use of the word "certificate" (p. 271), the author uses this term in presenting some illustrative audit reports (p. 308). These minor objectionable features are not intended to reflect unfavorably on the book as a whole.

In appraising the book in its entirety, one should go back to the fourfold purpose which it is intended to serve. Compromises are inevitable when one attempts to write for readers having different levels of interest, technical training, and background. For this reason, the book appears to fall short of the author's objective in providing a reference book for seasoned professional auditors. On the other hand, its readability and modern approach are points in its favor. If used in conjunction with a book of questions, problems and case (practice-set) material, it has much in its favor as a text in a one-term course for students.

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HOWARD F. STETTLER, *Auditing Principles* (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1956, pp. xvi, 712, $9.00).

This text is a synthesis of the author's experience with a leading national firm of public accountants and as a teacher of auditing. His aim is to present the subject matter as it would be seen through the eyes of a senior accountant who must have in mind his own immediate activities and responsibilities, the needs of his principal, and the purposes and techniques of the auditing steps to be carried out by the junior accountants whom he is supervising.

An introduction to auditing, including the content, purpose and significance of the auditor's report, is presented (ch. 1). Independence and auditor's legal liability are treated (ch. 2), the former topic being developed by reference to the Institute's rules of professional conduct and the Securities and Exchange Commission Regulation S-X. In discussing the matter of auditor's financial interest in client's business (rule 13), the following comment (pp. 21–22) is made, "The requirements are much less rigid when the statements are for credit purposes, and the investing public as a whole will not be involved." It is difficult to see why the credit grantor should be expected to evaluate the independence and objectivity of the auditor. Also, it would appear impossible for the auditor to control the use of his report after he has released it to the client. Reference to and a brief discussion of leading cases would have made the material on accountants' liability more meaningful.

The importance, nature, and evaluation of internal check and the topic of internal auditing are covered (ch. 3). Further discussion of the independent auditor's use of the internal auditor's work would have been helpful.

Types of auditing evidence (physical and documentary) and classifications of documentary evidence and evaluation are discussed (ch. 4). In addition, the related topics of materiality and relative risk are treated. Subject matter in general follows the author's article, "Auditing Standards and Competence of Evidential Matter," which appeared in THE ACCOUNTING REVIEW of January 1954. The reader may become so engrossed in following the several classifications of documentary evidence that he will fail to grasp and retain the full importance of the evaluation of each. Documents originating outside the client's organization purportedly have a high degree of reliability, particularly when they are sent by the outsider to the auditor. Confirmations are discussed in this light and the comment (p. 60) is made, "The best indication of the validity of an account is to have the debtor confirm in writing to the auditor the amount which the debtor owes to the auditor's client." In discussing alternative procedures to be applied when confirmation replies can not be obtained from certain debtors, the comment (p. 120) is made that "Reference to evidence of subsequent payment of an account ordinarily constitutes the best indication of the validity of the account." These two comments appear contradictory.

Introductory technical phases of the auditor's work are covered (ch. 5). Specimen adjusting and reclassifi-

cation entries and working balance sheet and income statement are included. The working trial balance set up in classified statement form is an excellent technique to facilitate the preparation of formal statements.

The examination of real and related nominal accounts and special aspects of revenue-income and costs-expenses are treated (ch. 6–15). A three-step plan of organization and presentation is followed in each chapter: first, the elements of good internal control; second, requirements and implications of minimum standards of financial statements presentation; and third, verification of statement amounts and procedures and theory underlying each. A narrative discussional type of presentation is used to develop procedures, rather than a long list of procedures for verification of the account. The author purposely omitted long lists of procedures because he feels that such lists may result in the notion that an audit is simply the performance of those procedures (pref. viii). However, the author discusses (ch. 3) the use of internal control questionnaires and also includes (app. A) a fourteen page questionnaire. Appropriate use is made of the Institute's publications, and portions of one or more *Case Studies in Auditing Procedures* along with specimen working papers are included at the end of each chapter. Problem material appears to have been satisfactorily selected; much of it is drawn from C.P.A. examinations.

In order to emphasize the importance of confirmation of receivables and physical aspects of inventory verification, the McKesson & Robbins case is discussed and a long excerpt from the S.E.C. report thereon is included (app. B).

The author has minimized the discussion of accounting theory; when he has discussed theory he has generally been to the point and adequate. However, some question may well be raised with respect to the author's summary prediction (p. 219) of the eventual universal adoption of Lifo cost valuation of inventories for use in the determination of income and his conclusive statement (p. 325) as to the desirability of charging annual depreciation on replacement cost of fixed assets.

Some other points of questionable propriety were observed in reviewing the remainder of the chapters in this group; however, only one point will be mentioned here. In developing the program for payroll tests (pp. 519–520), no reference was made to the use of the employment records. This procedure appears necessary in order to verify that an employee had been placed on the payroll and that his rate of pay is in accordance with pertinent approvals.

After completing the coverage of the various accounts, certain miscellaneous audit matters are considered, including such important topics as examination of journal vouchers, postings, minutes of stockholders and directors, and review of subsequent events.

Standards of reporting (ch. 17–18) include both the short- and long-form reports. The important topics of disclaimers and qualifications are appropriately covered. Variations of the short-form report and principles of long-form preparation are adequately covered, and two long-form reports provide very good illustrations. The first is a well-written conventional type of long-form report and the second is a management-type of report. The latter will prove of interest to accounting firms attempting to reach beyond conventional reporting.

The appendix (pp. 649–702) includes reprints or excerpts fron certain significant publications. The inclusion of this material makes it readily available for student use. The following materials are included:

A. Internal control questionnaire from *Case Studies in Internal Control No. 2*
B. S.E.C. report on McKesson & Robbins
C. *Extensions of Auditing Procedure*
D. *Rules of Professional Conduct*
E. "Statistical Interpretation of Auditing Test Checks"

Whether auditing standards and procedures are presented through the eyes of the senior accountant or the senior accounting major, these should be covered and presented in such a manner as to be understood by the reader. The author has done a generally good job of presenting auditing standards and procedures. If the instructor treats the text as a point of departure in teaching auditing, the items questioned by the reviewer will give little trouble to the student. On the other hand, if an instructor adheres strictly to the text, some difficulty may be experienced with the items which disturbed this reviewer.

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General

Harry G. Guthmann and Herbert E. Dougall, *Corporate Financial Policy*, third edition (New York: Prentice-Hall, Inc., 1955, pp. xxvi, 766, $6.95 (text); $9.25 (trade).

Teachers of corporation finance at all levels of college training as well as those concerned directly with the problems of financial management in business will find the latest revised edition of *Corporate Financial Policy* a most challenging book. Within a single volume the authors have organized skillfully both historical and current financial practices found in a wide range of businesses, and they have presented extensive materials to reflect the thinking of the financial community on equally as wide a range of financial problems.

There are quite a few major changes in the current edition. The chapters on common and preferred stock have been separated; the chapter dealing with capital structures has been improved; the chapters on working capital management and current financing have been expanded considerably; a separate chapter on inter-

mediate financing is included; and the chapter on reorganization has been reworked.

At a first glance, one might conclude that continuation of the basic format used in the previous edition would allow small room for revision improvement. The traditional approach to corporation finance is used predominately. However, considerable revisions throughout the text, as well as substantial expansion of those chapters dealing with internal financial management problems, are sufficient evidence to suggest some moderation in the thinking of the authors in their approach to the subject. Greater emphasis has been placed on internal financing, but they have not adopted completely the financial management approach used by some of the other authors in the finance field.

This moderation in approach to the subject has improved the versatility of the text from a pedagogical point of view. For those instructors desiring to offer a predominately descriptive course in finance, there are more than adequate materials to meet this objective. On the other hand, some supplemental materials are likely to be needed by those seeking to offer a completely analytical course with emphasis on internal financial management. Recourse to accounting and other disciplines will be required to develop a detailed treatment of the tools of financial administration. For those instructors seeking to blend description and analysis into their finance courses, this text seems ideally suited.

With the tendency for accountants to find themselves playing an increasingly important role in helping businessmen decide in matters of financial policy, it would seem warranted to suggest that they too would find this book most valuable as a ready reference in carrying out their professional responsibilities. The skill with which the technical aspects of securities, capital structures, dividends, mergers and taxation—to name a few—are integrated into overall financial policy, would seem of unusual interest to members of this profession. To cite an illustration, the impact of taxation upon financial policy is discussed repeatedly throughout the book, yet it is clear that taxation cannot be isolated from overall financial policy. For example, in contrasting preferred stock with bonds (p. 101) the significance of the tax advantage to bonds is made most clear. Yet, in the discussion of sales-leaseback financing (pp. 471–477) it is made equally clear that taxation is far down the list among those factors to be weighed in making a financial policy decision in cases of this kind. It is refreshing to find countless such illustrations of sound judgment in integrating the many technical components of financial policy, throughout this book.

There is no need to suggest possible minute criticisms of detail. This book is written and documented so well that it stands in a class by itself. Even those inclined to be most critical of texts in this field will find that, if for no other single reason, the comprehensive bibliography would justify the price of admission.

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FREDERICK C. MILLS, *Statistical Methods*, Third Edition (New York: Henry Holt and Co. 1955, pp. xviii, 842, $6.95).

The author has certainly achieved his basic objectives of making this text "a more effective instrument for instruction in the logic and methodology of modern statistics and a more useful handbook for the practicing statistician." Emphasis has been placed upon making the exposition intelligible and applicable for the non-mathematical reader. The practicing statistician may not only apply the methods demonstrated but also comprehend the underlying assumptions and limitations attached to these methods. The text runs the gamut of statistical techniques and applications of most standard texts and also takes into account the more important and recent applications of statistics in the social sciences, business administration and governmental affairs.

The major change in organization from previous editions is the early introduction of *statistical inference*—Chapter 6. This is the essence of modern statistics and offers the practitioner necessary discipline in the scientific method and experience in applied logic. The introductory explanation gives the essential and basic underlying philosophy necessary to the non-mathematical reader for the understanding of the next two chapters, which treat in detail the problems of estimation and testing of hypotheses.

The analysis of time series and index numbers, which are important in the understanding of business and economic forecasting and fluctuations, is thoroughly explained both as to methods of computation as well as uses in Chapters 11, 12, 13 and 14. It would have proved advantageous to the reader, however, had a single series been utilized in isolating the trend, seasonal, and cyclical pattern, rather than the use of three different series for the three topics.

Linear correlation is covered in Chapter 9 and nonlinear and multiple correlation are discussed in Chapters 17 and 18. It might have proved beneficial to the reader had the general topic of correlation been presented in one section for continuity, but as the author admits there is no one proper order for treatment of topics, and he leaves this to the discretion of the individual teacher. The author's discussion and explanation of correlation are easily understood and readily applied. The clear exposition of the subject removes much of the stigma attached to the subject and makes it palatable and understandable for the student.

The chi square distribution and its application for tests of independence, goodness of fit, homogeneity and other uses are thoroughly discussed in Chapter 15. Yate's correction is discussed for the 2×2 contingency table but the author fails to note that the correction is sometimes of doubtful benefit and that it may also be applied when testing a sample proportion in relation to a population proportion.

The analysis of variance, one of the more useful tools for the solution of a variety of practical problems, is covered in Chapter 16. Fisher's Z and the F test are covered completely with problems illustrating their applications. The analysis of variance is applied subse-

quently in future chapters demonstrating its other applications. This is one of the finest and most easily understood treatments of this difficult part of statistics.

The appendix forms an integral part of the text. It includes such things as the explanation of the Doolittle Method, asymptotic curves for application in trend analysis, derivations, and the more useful tables used in statistical analysis.

Another outstanding feature of this text is the bibliography at the close of each chapter. It is complete and up to date.

Professor Mills should be complimented for his contribution of a most useful text in the field of statistics. Though some may argue with the organization and treatment of certain subjects, the material is presented in a manner easily understood and enlightening; this will continue to be a text highly sought after by both practicing statistician and student.

SCOTT DAYTON'S *A Manual of Problems in Statistics*, Revised Edition (New York: Henry Holt and Company, 1955, pp. 137), is a companion volume to Mill's *Statistical Methods*, 3rd edition. However it may be readily used in association with other standard texts in statistics. The problems cover all phases of statistical analysis; they are short but illustrative.

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RICHARD M. SNYDER, *Measuring Business Changes* (New York: John Wiley & Sons, Inc., 1955, pp. 382, price $7.95).

As our economy becomes more and more complex, few businesses can operate independently of "outside" developments. The quantity of outside data has grown tremendously. This handbook has been written for businessmen and for business advisors such as accountants in order to acquaint them with selected data of this type.

The volume is primarily a handbook of selected business indicators rather than of business statistics. The author provides a rather detailed description of the nature and composition, as well as uses and limitations, of a selected group of 50-odd of the more important such indicators. In this respect the book differs somewhat from another book of a similar title, *Measures of Business Change* by Arthur H. Cole. The latter is more of a comprehensive catalog of business measures, containing sources of current and historical data with a short description of 449 series.

The business indicators selected by Snyder are classified under nine headings: National Income and Product, Population, Labor: Employment and Earnings, Commodity Prices, Production and Business Activity, Construction Activity and Costs, Trade, Financial Activity, Stock Prices. Each of these sections is introduced briefly. Individuals not familiar with national income accounting will benefit from the author's introductory description of this area.

A general outline is followed, in the main, for each indicator. A description of the indicator presents the high spots, including in some cases uses and limitations. It is in the expansion of the material on uses and limitations that this reviewer believes the book would have even greater usefulness. The sources of current data are presented followed by the sources of historical data. Under the heading of "Composition" the author gives a more complete account of the indicator with a limited repetition of the preceding summary. Herein are included the indicator formula, weighting and adjustment of data, data gathering processes, and an explanation of revisions made in the series. Fitting the diverse indexes into this general outline makes for a convenient reference work.

Almost all of the major indexes have been revised during the past few years. The author has taken the opportunity to bridge these changes for the reader in a thoroughgoing manner. In this respect the handbook is excellent, both for those who are relatively unfamiliar with the available data, as well as those needing a convenient reference for revisions of which they are aware.

Written primarily for businessmen and non-statisticians, the book is presented in a clear easy-to-follow style. The handbook organization provides assistance in locating required information. This book should be a welcome addition to an accountant's library especially in view of the continued demand for administrative services and managerial advice.

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LLEWELLYN R. SNYDER, *Elements of Business Mathematics for Colleges* (New York: McGraw-Hill Book Company, 1956, pp. x, 249, $3.75).

This book is intended to provide a review and a basic knowledge of arithmetic computations and their application to selected types of business problems. The object is to provide an employable skill in the arithmetic required in business and in business courses.

The text thus restricted to arithmetic does not attempt in any manner to deal with algebra, logarithms, compound interest formulas and their application, life insurance, etc. It is designed for those who have only a limited mathematical background and a limited amount of time to devote to the subject.

Part I of the text, consisting of four chapters (127 pages), is devoted to explanation and review of the fundamental processes of arithmetic. The selection of subject matter for this purpose is good, although opinions may differ as to the effectiveness of the methods of presentation used. Ample problems and drill materials are provided, and a student workbook closely paralleling the text exercises is also available. Problems have been selected throughout to illustrate typical situations in which the particular arithmetic processes are used.

Students could normally be expected to have difficulties with the subjects of aliquot parts, ratio and proportion, and rate per cent. It is the reviewer's opinion, however, that these sections of the text (pages 101 to 121) could be simplified by a different order of presentation of subject matter, and by improved exposition and illustration.

Part II of the text, consisting of five chapters (102

pages), is entitled "Applied Business Mathematics" and covers the following topics:

Payroll computations, including payroll taxes and withholding, overtime, piece-rate computations, commissions, account sales, account purchases. (Chapter 5)

Trade discounts, cash discounts, mark-up, average inventory, and stock turnover. (Chapter 6)

Simple interest, ordinary and exact, 6% method with explanation of adaptation to other rates, product (dollar days) method with procedure for adapting to any normal rate, computation of effective rate of interest in installment buying and personal borrowing, bank discount and proceeds. (Chapter 7)

Determination of net worth, distribution of ownership, distribution of partnership profits, corporate ownership, common and preferred stock, dividends, trading on the equity. (Chapter 8)

Financial statements, distribution of overhead, depreciation (straight-line, declining balance and sum-of-the-years'-digits methods), sales taxes, property taxes (including determination of tax rate), fire insurance and coinsurance. (Chapter 9)

These topics are all treated in an elementary manner and should, for the most part, be easily assimilated by the student.

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Management

Mabel Newcomer, *The Big Business Executive—The Factors That Made Him—1900–1950* (New York: Columbia University Press, 1955, 164 pages, $4.00).

The last forty years or so have seen changes in the business and social structure of this country which are nothing less than revolutionary. The economic effects of this great managerial and social revolution have been well described. The quantitative mass social effects are also thoroughly documented. But this did not all happen by law, rule or regulation. It was put into effect by people, by individuals, and observers of the changes have long been curious about who these people really were, how they came to be where they finally arrived and what sort of backgrounds they had. I do not recollect any collection of biographical data such as Mabel Newcomer presents in *The Big Business Executive.*

This is what we might call a qualitative and quantitative analysis of one of the most important types of men who were basically responsible for the conception and carrying-through of the managerial revolution of the first half of this century. The book is strictly factual. Without any expression of alarm, praise, approval or disapproval, executives from 1900 to 1950 are classified and analyzed by nationality, religion, politics, education, business experience and many other characteristics.

It is interesting to check the observations of the small segment of business one man can know intimately with the broad view presented by the book. By and large, they tally well.

The general impression that the business leader of today is an entirely different type of man from the founders of the great enterprises and industries is substantiated by tables and statistics. As Dr. Newcomer says of the present day executive "He is a business administrator—a bureaucrat—with little experience outside his own corporation." The old type, creative, impulsive, ruthless, faithful to friends and rather unmindful of the public will not in the future get to the top in any established business and probably in very few new or developing ones.

The results of the managerial revolution have seldom been better expressed than by Dr. Newcomer in her final chapter:

> "This professionalization of leadership is deplored by many who fear that it might result in killing innovation and risk taking; that big business might settle into well-worn grooves, and change and progress be stifled. But if the performance of big business in recent years is taken as a test of the ability of these leaders, they must be judged successful. Any loss in imagination and daring appears to be offset by a more scientific approach to the problems of production and by more planning and research. Also, it is always possible that some detachment from the profit motive may encourage risk taking, within limits—a calculated risk rather than a hunch. Detachment from immediate profit may also make the leaders more ready to consider the claims of labor, of the consumer, and even of that hard-to-define group, the general public. In short, it may result in maximization of production rather than profits."

This is also an answer, in part at least, to many critics of business of the new-deal or similar persuasions although Dr. Newcomer presents it merely as a conclusion not only founded on but forced by the facts she presents.

Of particular interest to accountants is Table 36 on page 87, showing the first full-time position held by the executives under examination. In the generation of 1900, of 298 executives, none started as accountants. In the generation of 1925, accounting was represented by one out of 311, while in 1950, out of 830 executives, 23 began as accountants. Out of all the different beginning occupations, accounting scored the largest proportionate increase, while a number of other beginning occupations showed substantial decreases, particularly those who began in independent business or in clerical positions.

The book deserves careful study by corporate administrators and lawyers, accountants and others who serve business professionally. It also has a great deal to say to educators. Dr. Newcomer's analysis of the relation between education and executive advancement is keen and far reaching and leads to some conclusions which many observers of business will find rather surprising, particularly the relation between liberal arts

and technical training.

Taken all-in-all, this is a splendid piece of work. The conclusions are based solidly on facts. The facts are presented fully and logically and the general impression is that the facts were arrived at first and the conclusions reached later.

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LYNDALL URWICK, Editor, *The Golden Book of Management: An Historical Record of Seventy Pioneers* (London: Newman Neame Limited, 1956, pp. 298, 35s net).

This is a volume of biographical sketches of management leaders who died prior to 1955, from Australia, Austria, Belgium, Brazil, France, Germany, Great Britain, Italy, Poland, Switzerland and the United States, and who made "original and permanent contributions to the modern body of knowledge about management." Future volumes will cover the record of men and women still actively engaged in furthering management philosophy and technique.

The Golden Book of Management is wide-ranging in historical perspective, providing many leads to researchers not only in management but also in accounting, applied economics, engineering and statistics. Through description of the careers of sixty-nine men and one woman (American Mary Parker Follett, 1868–1933), the development of modern management is "traced to its present primary role in our society." Tribute is paid to many pioneers, among them James Watt (1769–1848), who set up the management organization to produce and market his father's steam engine; Henri Fayol (1841–1925), often referred to as the outstanding example of Continental managerial talent; Ernst Streeruwitz (1874–1952), who introduced rationalization in the Austrian Government; Walther Rathenau (1867–1922), who was assassinated for his farsighted theories; Ernest Solvay (1838–1922), who laid the basis of modern Belgium productivity; Francesco Mauro (1887–1952), who was the founder of the contemporary Italian management movement; and Elton Mayo (1880–1949), noted Harvard lecturer, who revolutionized our conceptions of why men like to work. The volume provides a summary of each individual's contribution to his country's or to the international management movement, the main facts of his career, the titles of his most important publications, and a description of his personal characteristics and a portrait.

The reviewer questions the classification of certain persons in this volume as leaders in the American management movement. For instance, exception is taken to the inclusion of Louis Brandeis (1856–1941) and the exclusion of J. Lee Nicolson (1862–1924). Only one American accountant finds a place in Col. Urwick's pages. This is James Oscar McKinsey (1889–1937), who focused attention on the importance of budgeting as a major instrument of management. McKinsey wrote the first standard work on budgeting in 1922, but he always insisted that "the structure of a budget must reflect not an arbitrary grouping of the figures designed to accord with accounting conventions or convenience, but the actual responsibilities resting on individuals." Thus his interest in budgeting led him directly to advocate sound organization planning as a basic element in the effectiveness of administration. He had a special facility for persuading top managements that the study of organization is not an academic amusement but a real factor in the economy of day to day operations. Thus he brought many leading corporations to appreciate that executives and supervisors can perform more effectively when they know what their responsibilities are, have authority commensurate with them and understand clearly their relationships with those discharging other functions."

The Golden Book of Management indirectly emphasizes that the role of accountants in the management movement, to date, has been of relatively small significance. Looking both backward and forward, one may hazard the guess that their future work will carry accountants more and more within the orbit of members of a group now loosely defined as "the management team." The implication here is that accountants—C.P.A.'s in practice and in industry—must increasingly become acquainted with traditional and modern management theory and procedure, and that University courses in the field of accounting more and more must emphasize accounting as a managerial tool.

At the present time, American accountants are challenged to maintain much closer contact than in the past with management organizations functioning in this country and overseas, and to learn to use the terms "automation," "efficiency audit," "linear programming" and "operations research" with facility. Even a cursory examination of accounting literature today indicates the increasing concern with every phase of management. Economics abstracts prepared by New York University and management abstracts of the British Institute of Management provide easy access to important developments in areas of theory and practice evolving into the specialized profession of management accounting. The *International Register of Research in the Social Sciences* (published by the Columbia University Press for UNESCO) and the *International Journal of Abstracts on Statistical Methods in Industry* (published by the International Statistical Institute) are also recommended.

Re-education and enlargement of horizons of practice may come hard for some professional accountants whose range, over the years, has been concentrated on annual audits and tax returns. It can be accomplished more smoothly if a start is made with Col. Urwick's introduction to the life and work of seventy pioneers who created the new field of management, frequently in the face of strong opposition to the theories underlying scientifically motivated workers and scientifically managed plants.

The Golden Book of Management has another indirect lesson for American accounting historians, urging them to make renewed effort to provide a similar record of outstanding accountants in this country and abroad.

To date little has been accomplished, but it is not too much to hope that the accounting profession in the near future will envisage the need for a throughgoing assessment of the accomplishments of pioneer practitioners. Such a work would not only pay tribute to what has been done in the past but encourage the rising generation whose stimulus now is drawn largely from accounting principles rather than from the ideals of the men who made American accountancy.

The record of the development of economic thought is preserved now in several studies such as, for example, in Professor Joseph A. Schumpeter's monumental *History of Economic Analysis* (Oxford University Press 1954), in Lord Keynes' charming *Essays in Biography* (Horizon Press 1951), and in Professor Roy Harrod's critique of a friend, *Life of John Maynard Keynes* (Macmillan 1952). Is economics more important to the commonweal than accountancy? Do economic historians have more to relate than do accounting historians? Perhaps one should join with Bernard Shaw in his "Pygmalion" lament that all men and women (including accountants and economists) are not more alike! It is the wish of this reviewer that some publisher's eye may alight on this paragraph, and the "green light" given to a volume similar to the one conceived and edited by Col. Urwick, only in this case it would cover accountants in practice and in industry instead of management leaders.

It is the reviewer's opinion that the "remembrance of things past" in the accounting profession will come—but the day must be speeded as the American Institute of Accountants will celebrate its seventy-fifth anniversary in 1962. A special responsibility, therefore, accrues to the history committee of the Institute to prepare a volume comparable in excellence to the one written by The Institute of Chartered Accountants of Scotland to mark its centenary. The description of American profession progress, from independent auditing to management specialism, must be written not by a professional journalist but by a professional historian who can, judiciously and impartially, relate the growth of professional accountancy from the days of the founding fathers to the present complexity and responsibility of the field. If this task can be accomplished with the qualities of historical range, professional knowledge and scholarly perspective with which Col. Urwick has endowed his volume, accountancy will acknowledge its debt to the past and clear the path for greater accomplishment in the future.

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